Access DB# 103120

SEARCH REQUEST FORM

Scientific and Technical Information Center

Requester's Full Name: Bret Chen Examiner #: 74195 Date: 9/11/03
Art Unit: 1762 Phone Number 308-3809 Serial Number: 09/505638
Mail Box and Bldg/Room Location: CP3 10031 Results Format Preferred (circle): PAPER DISK E-MAIL

If more than one search is submitted, please prioritize searches in order of need.

****

Please provide a detailed statement of the search topic, and describe as specifically as possible the subject matter to be searched. Include the elected species or structures, keywords, synonyms, acronyms, and registry numbers, and combine with the concept or utility of the invention. Define any terms that may have a special meaning. Give examples or relevant citations, authors, etc, if known. Please attach a copy of the cover sheet, pertinent claims, and abstract.

Title of Invention: ?

Inventors (please provide full names): ?

Earliest Priority Filing Date: ?

For Sequence Searches Only *Please include all pertinent information (parent, child, divisional, or issued patent numbers) along with the appropriate serial number.*

looking for the compound used as a precursor/source for a vapor deposition process (CVD, MOCVD, etc.)

****

STAFF USE ONLY

Searcher: EJ
Searcher Phone #:
Searcher Location:
Date Searcher Picked Up:
Date Completed: 9-12-03
Searcher Prep & Review Time: 5
Clerical Prep Time:
Online Time: 70

Type of Search

NA Sequence (#)
AA Sequence (#)
Structure (#) (2)
Bibliographic ✓ and
Litigation
Fulltext
Patent Family
Other

Vendors and cost where applicable

STN $249.58
Dialog
Questel/Orbit
DataLink
Lexis/Nexis
Sequence Systems
WWW/Internet
Other (specify)

PTO-1590 (8-01)

WHAT IS CLAIMED IS:

1. A method for processing a substrate, comprising:

a. depositing a metal film on the substrate by the decomposition of a first organometallic precursor in the presence of a processing gas; then

b. depositing a metal nitride film on the metal film by the decomposition of a second organometallic precursor in the presence of a nitrating reactant gas, wherein the first and second organometallic precursors have the formula:

$$(Cp(R)_n)_xMH_{y-x},$$

wherein:

Cp is a cyclopentadienyl functional group,

M is a metal selected from the group consisting of tantalum, vanadium, niobium, and hafnium,

R is an organic group,

n is an integer from 0 to 5,

x is an integer from 1 to 4, and

y is the valence of M.

2. The method of claim 1, wherein the organic group has at least one carbon-silicon bond.

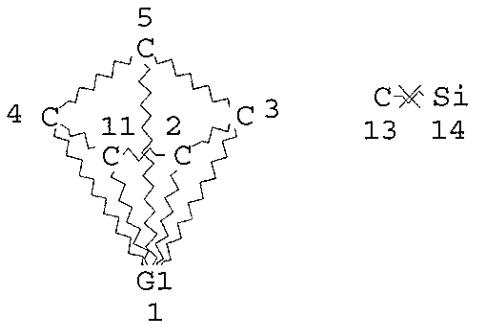
3. The method of claim 2, wherein the organic group comprises an alkyl silyl group having between 0 and 3 hydrocarbyl substituents selected from the group consisting of silyl, methylsilyl, dimethylsilyl, trimethylsilyl, and combinations thereof.

4. The method of claim 1, wherein the first and second organometallic precursors are the same organometallic precursor.

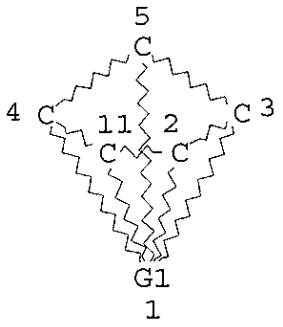
5. The method of claim 1, wherein the metal nitride film is deposited at a pressure of less than about 20 Torr.

```
=> file reg
FILE 'REGISTRY' ENTERED AT 11:38:57 ON 12 SEP 2003
USE IS SUBJECT TO THE TERMS OF YOUR STN CUSTOMER AGREEMENT.
PLEASE SEE "HELP USAGETERMS" FOR DETAILS.
COPYRIGHT (C) 2003 American Chemical Society (ACS)


=> display history full l1-

     FILE 'LREGISTRY' ENTERED AT 11:07:50 ON 12 SEP 2003
                E FERROCENE/CN
L1            1 SEA FERROCENE/CN
                D RN
L2              STR 102-54-5

     FILE 'REGISTRY' ENTERED AT 11:12:03 ON 12 SEP 2003
L3           50 SEA SSS SAM L2

     FILE 'LREGISTRY' ENTERED AT 11:12:45 ON 12 SEP 2003
L4              STR L2

     FILE 'REGISTRY' ENTERED AT 11:12:58 ON 12 SEP 2003
L5           50 SEA SSS SAM L4
L6        11044 SEA SSS FUL L4
                SAV TEM L6 CHE638/A
L7           50 SEA SUB=L6 SSS SAM L2
L8         2043 SEA SUB=L6 SSS FUL L2
                SAV L8 CHE638A/A

     FILE 'LCA' ENTERED AT 11:19:32 ON 12 SEP 2003
L9         7647 SEA (FILM? OR THINFILM? OR LAYER? OR OVERLAY? OR
                OVERLAID? OR LAMIN? OR LAMEL? OR SHEET? OR LEAF? OR
                FOIL? OR COAT? OR TOPCOAT? OR OVERCOAT? OR VENEER? OR
                SHEATH? OR COVER? OR ENVELOP? OR ENCAS? OR ENWRAP? OR
                OVERSPREAD?)/BI,AB

     FILE 'HCA' ENTERED AT 11:20:47 ON 12 SEP 2003
L10       51846 SEA NITRIDE#(2A)(L9 OR CLAD?)
L11       91610 SEA (CVD OR (CHEMICAL? OR CHEM)(2A)(VAPOR? OR VAPOUR?)(2A
                )DEPOSIT? OR OMCVD OR MOCVD OR LPCVD OR PECVD OR HFCVD
                OR ULPCVD OR PACVD OR PCVD)/BI,AB
L12         777 SEA L8
L13        4030 SEA L6
L14           1 SEA L12 AND L11
L15          40 SEA L13 AND L11
L16           7 SEA L15 AND L10

     FILE 'REGISTRY' ENTERED AT 11:22:17 ON 12 SEP 2003
L17        2442 SEA (M(L)N)/ELS (L) 2/ELC.SUB
L18        1614 SEA L17 AND ?NITRID?/CNS
```

```
     FILE 'HCA' ENTERED AT 11:27:04 ON 12 SEP 2003
L19         76118 SEA L18
L20             7 SEA L15 AND L19
L21        214198 SEA (METAL#### OR TANTALUM# OR TA OR VANADIUM# OR V OR
                  NIOBIUM# OR NB OR HAFNIUM# OR HF)(2A)(L9 OR CLAD?)
L22            24 SEA L15 AND L21

     FILE 'REGISTRY' ENTERED AT 11:30:32 ON 12 SEP 2003
L23          2110 SEA L6 AND SI/ELS

     FILE 'HCA' ENTERED AT 11:30:53 ON 12 SEP 2003
L24           784 SEA L23
L25             1 SEA L24 AND L11
L26             1 SEA L14 OR L25
L27             7 SEA (L16 OR L20) NOT L26
L28            16 SEA L22 NOT (L26 OR L27)
L29            16 SEA L15 NOT (L26 OR L27 OR L28)

     FILE 'REGISTRY' ENTERED AT 11:38:57 ON 12 SEP 2003


=> d l8 que stat
L2                STR
```




```
VAR G1=TA/V/NB/HF
NODE ATTRIBUTES:
NSPEC    IS RC      AT  13
NSPEC    IS RC      AT  14
DEFAULT MLEVEL IS ATOM
DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:
RING(S) ARE ISOLATED OR EMBEDDED
NUMBER OF NODES IS   8

STEREO ATTRIBUTES: NONE
L4                STR
```



VAR G1=TA/V/NB/HF
NODE ATTRIBUTES:
DEFAULT MLEVEL IS ATOM
DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:
RING(S) ARE ISOLATED OR EMBEDDED
NUMBER OF NODES IS 6

STEREO ATTRIBUTES: NONE
L6 11044 SEA FILE=REGISTRY SSS FUL L4
L8 2043 SEA FILE=REGISTRY SUB=L6 SSS FUL L2

100.0% PROCESSED 2110 ITERATIONS 2043 ANSWERS
SEARCH TIME: 00.00.01

=> file hca
FILE 'HCA' ENTERED AT 11:40:49 ON 12 SEP 2003
USE IS SUBJECT TO THE TERMS OF YOUR STN CUSTOMER AGREEMENT.
PLEASE SEE "HELP USAGETERMS" FOR DETAILS.

=> d l26 1 ibib abs hitstr hitind

L26 ANSWER 1 OF 1 HCA
ACCESSION NUMBER: 136:93805 HCA
TITLE: Deposition of **CVD** layers for copper metallization using novel metal organic **chemical vapor deposition** (**MOCVD**) precursors
INVENTOR(S): Kalyanam, Jagadish
PATENT ASSIGNEE(S): Applied Materials, Inc., USA
SOURCE: PCT Int. Appl., 48 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

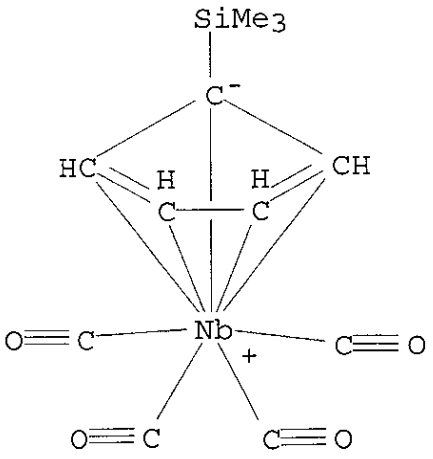
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2002005329	A2	20020117	WO 2001-US41212	20010629
WO 2002005329	A3	20020620		
W: CN, JP, KR, SG				
RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR				
US 6491978	B1	20021210	US 2000-612854	20000710

PRIORITY APPLN. INFO.: US 2000-612854 A 20000710

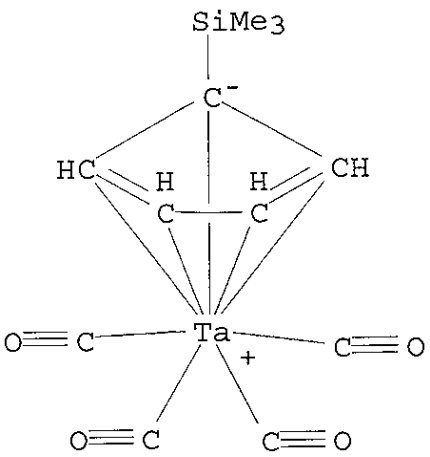
AB A method and app. for depositing a metal and/or metal nitride layer on a substrate by the thermal or plasma enhanced Dis-assocn. of an organometallic precursor having the formula of (Cp(R)n)xM(CO)y-x, in the presence of a processing gas, such as Ar, H, or NH3. In 1 embodiment the metal or metal nitride film is deposited at a pressure of .ltorsim.20 torr. The deposited metal or metal nitride layer may then be exposed to a plasma to remove contaminants, densify the layer, and reduce layer resistivity. The layer is useful as a liner or barrier layer for conducting metals and high dielec. const. materials in integrated circuit manufg.

IT **208242-23-3 208242-24-4**
(deposition of **CVD** metal and metal nitride layers for copper metalization using novel metal org. **chem.** **vapor deposition** (**MOCVD**) precursors)

RN 208242-23-3 HCA
CN Niobium, tetracarbonyl[(1,2,3,4,5-.eta.)-1-(trimethylsilyl)-2,4-cyclopentadien-1-yl]- (9CI) (CA INDEX NAME)



RN 208242-24-4 HCA
CN Tantalum, tetracarbonyl[(1,2,3,4,5-.eta.)-1-(trimethylsilyl)-2,4-cyclopentadien-1-yl]- (9CI) (CA INDEX NAME)



IC ICM H01L021-00
CC 75-1 (Crystallography and Liquid Crystals)
Section cross-reference(s): 29
ST **PECVD** metal nitride layer copper metalization
MOCVD precursor
IT Electrodeposition
(copper; deposition of **CVD** metal and metal nitride layers for copper metalization using novel metal org. **chem. vapor deposition** (**MOCVD**) precursors)
IT Integrated circuits
(fabrication of; deposition of **CVD** metal and metal nitride layers for copper metalization using novel metal org. **chem. vapor deposition** (**MOCVD**) precursors)
IT Vapor deposition process
(metalorg.; deposition of **CVD** metal and metal nitride layers for copper metalization using novel metal org. **chem. vapor deposition** (**MOCVD**) precursors)
IT Vapor deposition process
(plasma; deposition of **CVD** metal and metal nitride layers for copper metalization using novel metal org. **chem. vapor deposition** (**MOCVD**) precursors)
IT 7440-25-7, Tantalum, processes 12033-62-4, Tantalum nitride (TaN) 12033-94-2, Tantalum nitride (Ta3N5)
(**PECVD** film; deposition of **CVD** metal and metal nitride layers for copper metalization using novel metal org. **chem. vapor deposition** (**MOCVD**) precursors)
IT **208242-23-3 208242-24-4**
(deposition of **CVD** metal and metal nitride layers for copper metalization using novel metal org. **chem. vapor deposition** (**MOCVD**) precursors)

IT 7440-50-8, Copper, processes
(electroplated; deposition of **CVD** metal and metal nitride layers for copper metalization using novel metal org. **chem. vapor deposition** (**MOCVD**) precursors)
IT 7664-41-7, Ammonia, processes 7727-37-9, Nitrogen, processes 7803-62-5, Silane, processes
(processing gas; deposition of **CVD** metal and metal nitride layers for copper metalization using novel metal org. **chem. vapor deposition** (**MOCVD**) precursors)
IT 7440-59-7, Helium, uses
(processing gas; deposition of **CVD** metal and metal nitride layers for copper metalization using novel metal org. **chem. vapor deposition** (**MOCVD**) precursors)
IT 1333-74-0, Hydrogen, processes 7440-37-1, Argon, processes
(processing gas; deposition of **CVD** metal and metal nitride layers for copper metalization using novel metal org. **chem. vapor deposition** (**MOCVD**) precursors)

=> d l27 1-7 cbib abs hitstr hitind

L27 ANSWER 1 OF 7 HCA COPYRIGHT 2003 ACS on STN
135:337208 Method of forming metal **nitride film** by **chemical vapor deposition** and method of forming metal contact and capacitor of semiconductor device using the same. Lim, Hyun-seok; Kang, Sang-bom; Jeon, In-sang; Choi, Gil-heyen (S. Korea). U.S. Pat. Appl. Publ. US 20010034097 A1 20011025, 27 pp., Cont.-in-part of U.S. 6,197,683. (English). CODEN: USXXCO. APPLICATION: US 2001-765531 20010119. PRIORITY: KR 1997-49746 19970929; KR 1998-29531 19980722; US 1998-156724 19980918.

AB A method of forming a metal **nitride film** using **CVD**, and a method of forming a metal contact and a semiconductor capacitor of a semiconductor device using the same, are provided. The method of forming a metal **nitride film** using **CVD** in which a metal source and a nitrogen source are used as a precursor, includes the steps of inserting a semiconductor substrate into a deposition chamber, flowing the metal source into the deposition chamber, removing the metal source remaining in the deposition chamber by cutting off the inflow of the metal source and flowing a purge gas into the deposition chamber, cutting off the purge gas and flowing the nitrogen source into the deposition chamber to react with the metal source adsorbed on the semiconductor substrate, and removing the nitrogen source remaining in the deposition chamber by cutting off the inflow of the nitrogen source and flowing the purge gas into the deposition chamber. Accordingly, the metal **nitride film** having low resistivity and a low content of Cl even

with excellent step coverage can be formed at a temp. of 500.degree.. or lower, and a semiconductor capacitor having excellent leakage current characteristics can be manufd. Also, a deposition speed, .apprx.20 A/cycle, is suitable for mass prodn.

IT **25583-20-4**, Titanium nitride
(method of forming metal **nitride film** by **CVD** metal and method of forming metal contact and capacitor of semiconductor device using same)

RN 25583-20-4 HCA

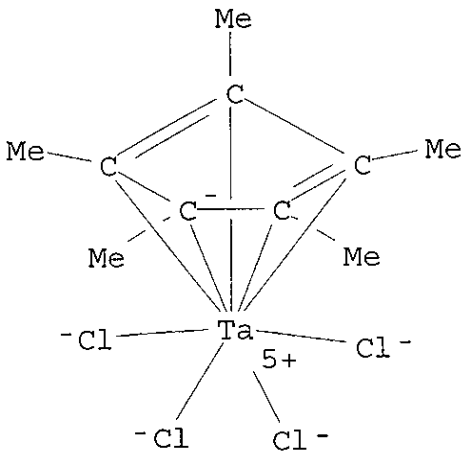
CN Titanium nitride (TiN) (7CI, 8CI, 9CI) (CA INDEX NAME)

N≡Ti

IT **71414-47-6**
(method of forming metal **nitride film** by **CVD** using metal source of)

RN 71414-47-6 HCA

CN Tantalum, tetrachloro[(1,2,3,4,5-.eta.)-1,2,3,4,5-pentamethyl-2,4-cyclopentadien-1-yl]- (9CI) (CA INDEX NAME)



IC H01L021-8242; H01L021-20; H01L021-44

NCL 438253000

CC 75-1 (Crystallography and Liquid Crystals)
Section cross-reference(s): 76

ST metal **nitride film CVD** elec contact capacitor semiconductor device

IT **Vapor deposition** process
(**chem.**; method of forming metal **nitride film** by **CVD** metal and method of forming metal contact and capacitor of semiconductor device using same)

IT Capacitors
Electric contacts
(fabrication; method of forming metal **nitride film** by **CVD** metal and method of forming metal contact and capacitor of semiconductor device using same)

IT Semiconductor device fabrication
(method of forming metal **nitride film** by **CVD** metal and method of forming metal contact and capacitor of semiconductor device using same)
IT Nitrides
(method of forming metal **nitride film** by **CVD** metal and method of forming metal contact and capacitor of semiconductor device using same)
IT **25583-20-4**, Titanium nitride
(method of forming metal **nitride film** by **CVD** metal and method of forming metal contact and capacitor of semiconductor device using same)
IT 7440-37-1, Argon, processes 7440-59-7, Helium, processes 7727-37-9, Nitrogen, processes
(method of forming metal **nitride film** by **CVD** under atm. of)
IT 1270-98-0 1271-19-8 3275-24-9, Tetradimethylamino titanium 4419-47-0, Tdeat 7550-45-0, Titanium chloride (TiCl4), processes 7705-07-9, Titanium chloride (TiCl3), processes 7720-83-4, Titanium iodide (TiI4) 7721-01-9, Tantalum chloride (TaCl5) 7783-63-3, Titanium fluoride (TiF4) 7783-71-3, Tantalum fluoride (TaF5) 11136-36-0 12129-06-5 13451-11-1, Tantalum bromide (TaBr5) 13783-04-5, Titanium bromide (TiBr2) 14693-81-3, Tantalum iodide (TaI5) 15719-81-0 58097-69-1 **71414-47-6** 84365-55-9 107333-47-1
(method of forming metal **nitride film** by **CVD** using metal source of)
IT 7664-41-7, Ammonia, processes
(method of forming metal **nitride film** by **CVD** using nitrogen source of)

L27 ANSWER 2 OF 7 HCA COPYRIGHT 2003 ACS on STN
131:275432 Characterization of PVD coatings in the V-C-N-O system and comparison with the properties of similar coatings obtained by **OMCVD**. [Erratum to document cited in CA129:319714]. Farges, G.; Sainte Catherine, M. C.; Nadal, M.; Poirier, L.; Teyssandier, F.; Ignat, M. (DGA/Centre Technique d'Arcueil, Arcueil, 94114, Fr.). Annales de Chimie (Paris), 23(7-8), 992 (French) 1998. CODEN: ANCPAC. ISSN: 0151-9107. Publisher: Editions Scientifiques et Medicales Elsevier.
AB A replacement for Fig. 9 on page 875 is given.
IT **113066-81-2**, Vanadium nitride VN0.73 **136183-70-5**, Vanadium nitride VN0.9
(characterization of PVD coatings in V-C-N-O system and comparison with properties of similar coatings obtained by **OMCVD** (Erratum))
RN 113066-81-2 HCA
CN Vanadium nitride (VN0.73) (9CI) (CA INDEX NAME)

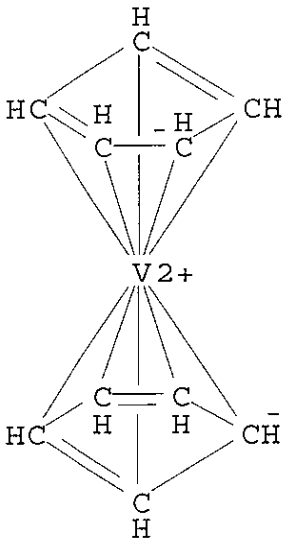
Component	Ratio	Component Registry Number

N	0.73	17778-88-0
V	1	7440-62-2

RN 136183-70-5 HCA
CN Vanadium nitride (VN0.9) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	0.9	17778-88-0
V	1	7440-62-2

IT **1277-47-0**, Vanadocene
(organometallic precursor; characterization of PVD coatings in V-C-N-O system and comparison with properties of similar coatings obtained by **OMCVD** (Erratum))
RN 1277-47-0 HCA
CN Vanadocene (9CI) (CA INDEX NAME)



CC 57-2 (Ceramics)
Section cross-reference(s): 55
ST erratum organometallic **CVD** vanadium carbide nitride;
organometallic **CVD** vanadium carbide nitride erratum;
CVD vanadium carbide **nitride coating**
erratum; magnetron sputtering vanadium carbide nitride erratum;
sputtering vanadium carbide **nitride coating**
erratum
IT Vapor deposition process
(metalorg.; characterization of PVD coatings in V-C-N-O system and comparison with properties of similar coatings obtained by **OMCVD** (Erratum))
IT Magnetron sputtering
(reactive; characterization of PVD coatings in V-C-N-O system and

comparison with properties of similar coatings obtained by **OMCVD** (Erratum))

IT Sputtering targets
(vanadium; characterization of PVD coatings in V-C-N-O system and comparison with properties of similar coatings obtained by **OMCVD** (Erratum))

IT **113066-81-2**, Vanadium nitride VN0.73 **136183-70-5**, Vanadium nitride VN0.9 214679-38-6, Vanadium carbide (VC0.61) 214679-39-7, Vanadium carbide (VC1.07) 214679-40-0, Vanadium carbide nitride (VC0.33N0.66) 214679-41-1, Vanadium carbide nitride (VC0.66N0.33) 214679-42-2, Vanadium carbide oxide (V0.48C0.48O0.04) 214679-43-3, Vanadium carbide oxide (V0.42C0.05O0.53)
(characterization of PVD coatings in V-C-N-O system and comparison with properties of similar coatings obtained by **OMCVD** (Erratum))

IT 62997-24-4, Vanadium carbide **nitride** (V2CN)
(**coatings**; characterization of PVD coatings in V-C-N-O system and comparison with properties of similar coatings obtained by **OMCVD** (Erratum))

IT **1277-47-0**, Vanadocene
(organometallic precursor; characterization of PVD coatings in V-C-N-O system and comparison with properties of similar coatings obtained by **OMCVD** (Erratum))

IT 7440-62-2, Vanadium, processes
(sputtering target; characterization of PVD coatings in V-C-N-O system and comparison with properties of similar coatings obtained by **OMCVD** (Erratum))

IT 12597-69-2, Steel, processes
(substrate; characterization of PVD coatings in V-C-N-O system and comparison with properties of similar coatings obtained by **OMCVD** (Erratum))

L27 ANSWER 3 OF 7 HCA COPYRIGHT 2003 ACS on STN
129:319714 Characterization of PVD coatings in the V-C-N-O system and comparison with the properties of similar coatings obtained by **OMCVD**. Farges, G.; Sainte Catherine, M. C.; Nadal, M.; Poirier, L.; Teyssandier, F.; Ignat, M. (DGA/Centre Technique d'Arcueil, Arcueil, 94114, Fr.). Annales de Chimie (Paris), 23(5-6), 863-878 (French) 1998. CODEN: ANCPAC. ISSN: 0151-9107. Publisher: Editions Scientifiques et Medicales Elsevier.

AB Vanadium nitride, carbide, carbonitride and oxycarbide coatings were produced on steel substrates, by reactive magnetron sputtering from a vanadium target or by **chem. vapor deposition** using vanadocene as an organometallic precursor. The compn. and crystallog. structure of coatings were detd. by different techniques. The mech. characteristics of the coatings are highly dependent on both their compn. and the deposition technique.

IT **113066-81-2**, Vanadium **nitride** VN0.73
136183-70-5, Vanadium **nitride** VN0.9
(**coatings**; characterization of PVD coatings in V-C-N-O system and comparison with properties of similar coatings

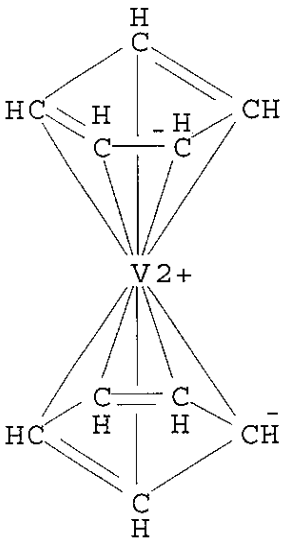
obtained by **OMCVD**)
RN 113066-81-2 HCA
CN Vanadium nitride (VN0.73) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	0.73	17778-88-0
V	1	7440-62-2

RN 136183-70-5 HCA
CN Vanadium nitride (VN0.9) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	0.9	17778-88-0
V	1	7440-62-2

IT **1277-47-0**, Vanadocene
(organometallic precursor; characterization of PVD coatings in V-C-N-O system and comparison with properties of similar coatings obtained by **OMCVD**)
RN 1277-47-0 HCA
CN Vanadocene (9CI) (CA INDEX NAME)



CC 57-2 (Ceramics)
Section cross-reference(s): 55
ST organometallic **CVD** vanadium carbide **nitride coating**; magnetron sputtering vanadium carbide **nitride coating**
IT Vapor deposition process
(metalorg.; characterization of PVD coatings in V-C-N-O system

and comparison with properties of similar coatings obtained by **OMCVD**)

IT Magnetron sputtering
(reactive; characterization of PVD coatings in V-C-N-O system and comparison with properties of similar coatings obtained by **OMCVD**)

IT Sputtering targets
(vanadium; characterization of PVD coatings in V-C-N-O system and comparison with properties of similar coatings obtained by **OMCVD**)

IT 62997-24-4, Vanadium carbide **nitride** (V2CN)
113066-81-2, Vanadium **nitride** VN0.73
136183-70-5, Vanadium **nitride** VN0.9 214679-38-6, Vanadium carbide (VC0.61) 214679-39-7, Vanadium carbide (VC1.07) 214679-40-0, Vanadium carbide nitride (VC0.33N0.66) 214679-41-1, Vanadium carbide nitride (VC0.66N0.33) 214679-42-2, Vanadium carbide oxide (V0.48C0.48O0.04) 214679-43-3, Vanadium carbide oxide (V0.42C0.05O0.53)
(**coatings**; characterization of PVD coatings in V-C-N-O system and comparison with properties of similar coatings obtained by **OMCVD**)

IT **1277-47-0**, Vanadocene
(organometallic precursor; characterization of PVD coatings in V-C-N-O system and comparison with properties of similar coatings obtained by **OMCVD**)

IT 7440-62-2, Vanadium, processes
(sputtering target; characterization of PVD coatings in V-C-N-O system and comparison with properties of similar coatings obtained by **OMCVD**)

IT 12597-69-2, Steel, processes
(substrate; characterization of PVD coatings in V-C-N-O system and comparison with properties of similar coatings obtained by **OMCVD**)

L27 ANSWER 4 OF 7 HCA COPYRIGHT 2003 ACS on STN
129:319709 Potentiality of the formation of thin films within the Ti-V-C-N ceramic system using molecular precursors. Valade, L.; Choukroun, R.; Danjoy, C.; Chansou, B.; De Caro, D.; Cassoux, P. (Laboratoire de Chemie de Coordination du CNRS, Precurseurs Moleculaires et Materiaux, Toulouse, 31077, Fr.). Annales de Chimie (Paris), 23(5-6), 721-732 (French) 1998. CODEN: ANCPAC. ISSN: 0151-9107. Publisher: Editions Scientifiques et Medicales Elsevier.

AB Monometallic and heterobimetallic titanium and vanadium compds. were prepd. and studied as precursors to the **chem.** **vapor deposition** (**CVD**) of carbide and **nitride** ceramic thin **films**. Their thermal properties are discussed according to the chem. environment of the metal atom and their **CVD** behavior is studied. Two of them, CpTiCl2N(SiMe3)2 and Cp2VMe2 (Cp = C5H5), are applied to the deposition of thin films within the Ti-V-C-N quaternary system.

IT **24646-85-3**, Vanadium **nitride** vn **25583-20-4**, Titanium **nitride** tin

(**films**; potentiality of formation of thin films within Ti-V-C-N ceramic system using mol. precursors)

RN 24646-85-3 HCA
CN Vanadium nitride (VN) (6CI, 8CI, 9CI) (CA INDEX NAME)

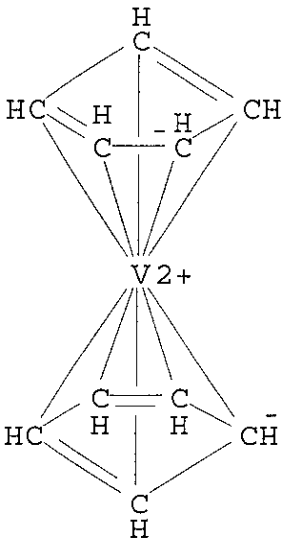
N≡V

RN 25583-20-4 HCA
CN Titanium nitride (TiN) (7CI, 8CI, 9CI) (CA INDEX NAME)

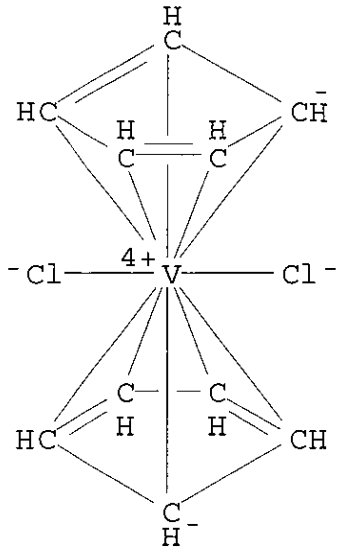
N≡Ti

IT **1277-47-0**, Vanadocene **12083-48-6**
12146-93-9 12701-79-0 54111-39-6
54761-79-4 59139-01-4 62363-03-5
(precursor; potentiality of formation of thin films within Ti-V-C-N ceramic system using mol. precursors)

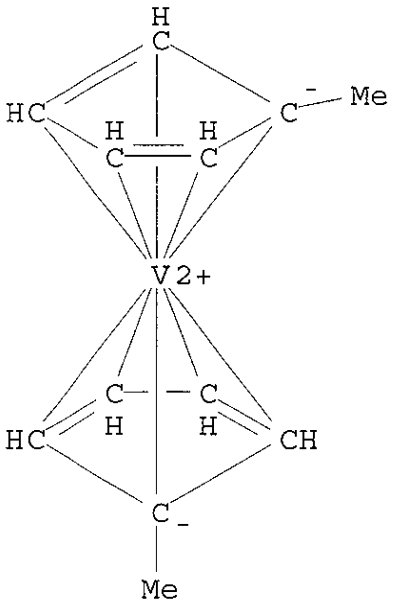
RN 1277-47-0 HCA
CN Vanadocene (9CI) (CA INDEX NAME)



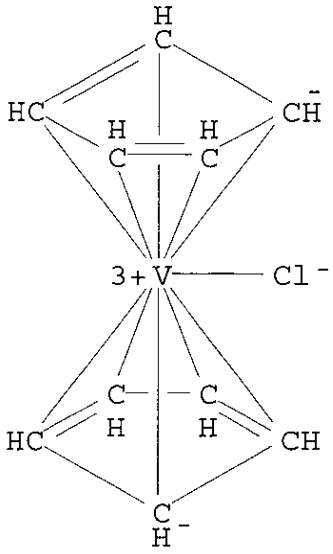
RN 12083-48-6 HCA
CN Vanadium, dichlorobis(.eta.5-2,4-cyclopentadien-1-yl)- (9CI) (CA INDEX NAME)



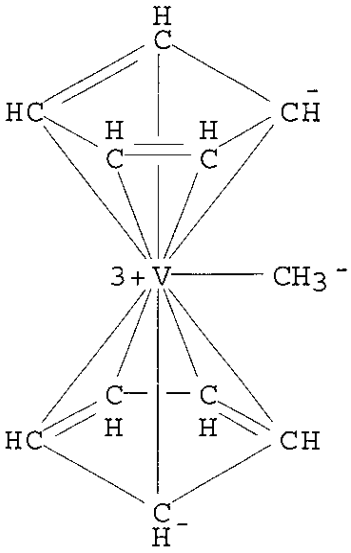
RN 12146-93-9 HCA
CN Vanadocene, 1,1'-dimethyl- (9CI) (CA INDEX NAME)



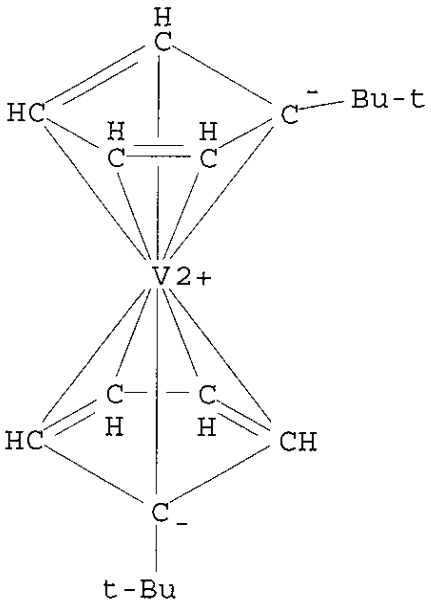
RN 12701-79-0 HCA
CN Vanadium, chlorobis(.eta.5-2,4-cyclopentadien-1-yl)- (9CI) (CA INDEX NAME)



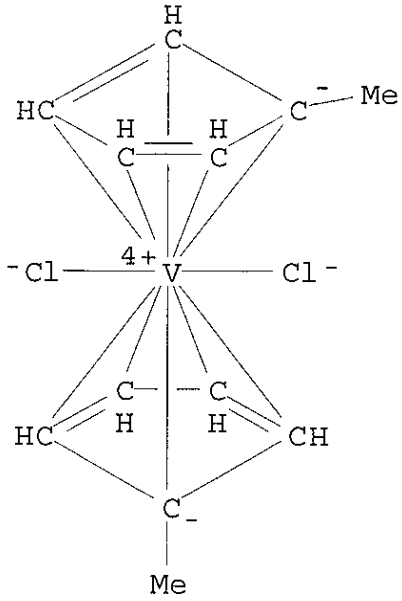
RN 54111-39-6 HCA
CN Vanadium, bis(.eta.5-2,4-cyclopentadien-1-yl)methyl- (9CI) (CA INDEX NAME)



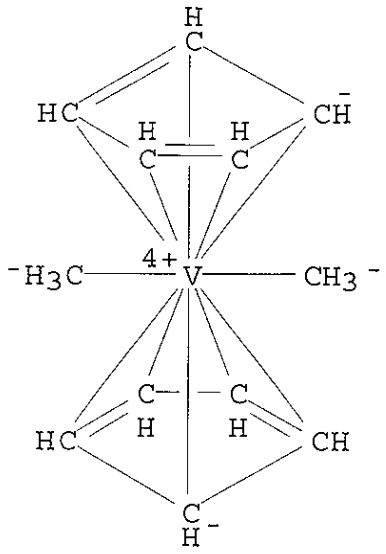
RN 54761-79-4 HCA
CN Vanadocene, 1,1'-bis(1,1-dimethylethyl)- (9CI) (CA INDEX NAME)



RN 59139-01-4 HCA
CN Vanadium, dichlorobis[(1,2,3,4,5-.eta.)-1-methyl-2,4-cyclopentadien-1-yl]- (9CI) (CA INDEX NAME)



RN 62363-03-5 HCA
CN Vanadium, bis(.eta.5-2,4-cyclopentadien-1-yl)dimethyl- (9CI) (CA INDEX NAME)



CC 57-2 (Ceramics)
ST **CVD** titanium vanadium carbide nitride precursor; organometallic compd titanium vanadium precursor **CVD**
IT 12070-08-5, Titanium carbide TiC 12070-10-9, Vanadium carbide vc 12627-33-7, Titanium carbonitride **24646-85-3**, Vanadium **nitride** vn **25583-20-4**, Titanium **nitride** tin 37232-24-9, Vanadium carbonitride 169279-78-1, Vanadium carbide silicide
(**films**; potentiality of formation of thin films within Ti-V-C-N ceramic system using mol. precursors)
IT 1270-98-0 1271-19-8 **1277-47-0**, Vanadocene 11078-01-6 **12083-48-6** 12129-51-0 **12146-93-9** **12701-79-0** 19824-57-8 24618-62-0 37512-30-4 52676-23-0 **54111-39-6** **54761-79-4** **59139-01-4** 60955-54-6 **62363-03-5** 71713-64-9 71713-68-3 80545-62-6 90941-76-7 99589-88-5 107946-45-2 136762-09-9 136762-13-5 157369-02-3 214750-65-9 214750-66-0
(precursor; potentiality of formation of thin films within Ti-V-C-N ceramic system using mol. precursors)

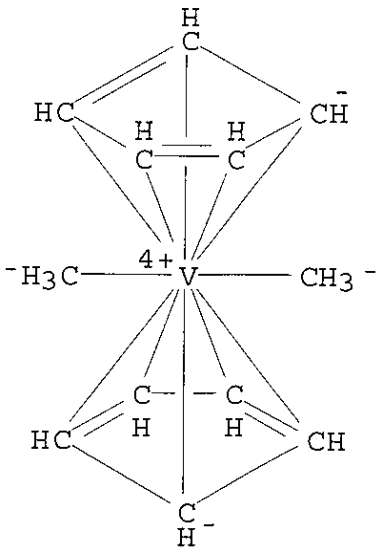
L27 ANSWER 5 OF 7 HCA COPYRIGHT 2003 ACS on STN
128:285468 Evaluation of the simultaneous use of Cp2VMe2 and CpTiCl2N(SiMe3)2 as precursors to ceramic thin films containing titanium and vanadium: towards titanium-vanadium carbonitride. Valade, L.; Danjoy, C.; Chansou, B.; Riviere, E.; Pellegatta, J. -L.; Choukroun, R.; Cassoux, P. (Equipe Precurseurs Moleculaires et Materiaux, Laboratoire de Chimie de Coordination, CNRS, Toulouse, 31077, Fr.). Applied Organometallic Chemistry, 12(3), 173-187 (English) 1998. CODEN: AOCHEX. ISSN: 0268-2605. Publisher: John Wiley & Sons Ltd..
AB Ceramic thin films contg. titanium, vanadium, carbon, oxygen and

nitrogen were obtained on steel substrates at 873 K, under nitrogen and helium gases and at low pressure, by **chem.** **vapor deposition** (**CVD**) from two organometallic precursors, CpTiCl2N(SiMe3)2 and Cp2VMe2 (Cp, cyclopentadienyl). Independent TG-DTA-MS and **CVD** studies of the two precursors showed their ability to co-decomp. within compatible temp. and pressure domains. The mechanism of the reactions occurring inside the **CVD** app. was also approached by GC-MS and NMR analyses of the condensed decompn. products. **CVD** conducted under He gas confirmed that the formation of nitride resulted from the nitrogen atoms of the precursor, but the nitrogen content in the films remained lower than approx. 5%. Higher nitrogen contents (up to 12%) were only obtained when using ammonia as a carrier gas. Both precursors being air- and moisture-sensitive, high-purity **CVD** equipment was used to reduce oxycarbide formation.

IT **62363-03-5**
(precursor; evaluation of the simultaneous use of Cp2VMe2 and CpTiCl2N(SiMe3)2 as precursors to ceramic thin films contg. titanium and vanadium: towards titanium-vanadium carbonitride)

RN 62363-03-5 HCA

CN Vanadium, bis(.eta.5-2,4-cyclopentadien-1-yl)dimethyl- (9CI) (CA INDEX NAME)



CC 57-2 (Ceramics)
Section cross-reference(s): 29, 55

ST titanium vanadium carbonitride **CVD** organometallic precursor

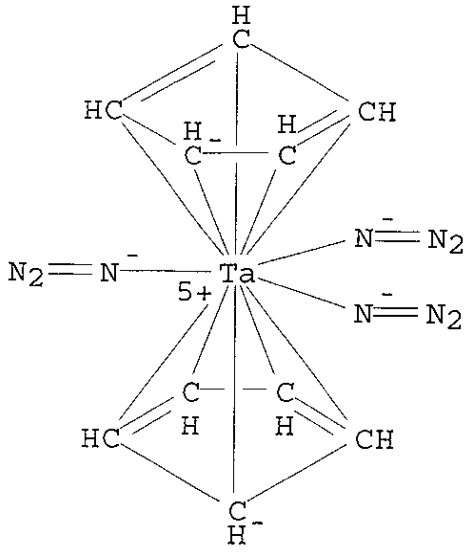
IT **Vapor deposition** process
(**chem.**; evaluation of the simultaneous use of Cp2VMe2 and CpTiCl2N(SiMe3)2 as precursors to ceramic thin films contg. titanium and vanadium: towards titanium-vanadium carbonitride)

IT 136396-42-4P, Titanium vanadium carbide **nitride**
(**films**; evaluation of the simultaneous use of Cp2VMe2 and CpTiCl2N(SiMe3)2 as precursors to ceramic thin films contg. titanium and vanadium: towards titanium-vanadium carbonitride)
IT **62363-03-5** 136762-09-9
(precursor; evaluation of the simultaneous use of Cp2VMe2 and CpTiCl2N(SiMe3)2 as precursors to ceramic thin films contg. titanium and vanadium: towards titanium-vanadium carbonitride)

L27 ANSWER 6 OF 7 HCA COPYRIGHT 2003 ACS on STN
124:133073 Manufacture of highly dielectric tantalum oxynitride films in semiconductor devices. Hasegawa, Toshiaki (Sony Corp, Japan). Jpn. Kokai Tokkyo Koho JP 07263442 A2 19951013 Heisei, 5 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1994-72504 19940317.
AB The films, suitable for use in DRAM as capacitor elements, consists of TaxOyNz [(x + y + z) = 1; 0.1 .ltoreq. z .ltoreq. 0.625; 0 .ltoreq. y .ltoreq. 0.6; x .gtoreq. (0.4 + 0.6 z)], formed, typically, by an O2-plasma **CVD** using (Cp)2Ta(N3)3 as a precursor.
IT **12033-94-2**, Tantalum nitride (Ta3N5)
(manuf. of high dielec. tantalum oxynitride films in DRAM capacitors)
RN 12033-94-2 HCA
CN Tantalum nitride (Ta3N5) (7CI, 8CI, 9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	5	17778-88-0
Ta	3	7440-25-7

IT **173090-62-5**
(manuf. of high dielec. tantalum oxynitride films in DRAM capacitors)
RN 173090-62-5 HCA
CN Tantalum, triazidobis(.eta.5-2,4-cyclopentadien-1-yl)- (9CI) (CA INDEX NAME)



IC ICM H01L021-316
ICS C01G035-00; C23C016-32; C23C016-40; H01L027-04; H01L021-822; H01L021-8242; H01L027-108
CC 76-3 (Electric Phenomena)
ST tantalum oxynitride capacitance DRAM plasma **CVD**
IT **12033-94-2**, Tantalum nitride (Ta3N5) 52036-92-7, Tantalum nitride oxide 173090-63-6, Tantalum nitride oxide (Ta0.5N0.4O0.1) 173090-64-7, Tantalum nitride oxide (Ta0.5N0.1O0.4) 173090-65-8, Tantalum nitride oxide (Ta0.5N0.2O0.3)
(manuf. of high dielec. tantalum oxynitride films in DRAM capacitors)
IT **173090-62-5**
(manuf. of high dielec. tantalum oxynitride films in DRAM capacitors)

L27 ANSWER 7 OF 7 HCA COPYRIGHT 2003 ACS on STN
123:235537 Molecular precursors for **OMCVD** preparation of TiN, VN, TiC and VC thin-film ceramic materials. Cassoux, P.; Choukroun, R.; Cyr-Athis, O.; Feurer, R.; Laurent, F.; Morancho, R.; Teyssandier, F.; Valade, L. (Laboratoire de Chimie de Coordination, CNRS, Toulouse, 31077, Fr.). Transactions of the Materials Research Society of Japan, 19A(Superconductors, Surfaces and Superlattices), 185-8 (English) 1994. CODEN: TMRJE3. ISSN: 1382-3469. Publisher: Elsevier.
AB Twenty-two organometallic mol. compds. have been prepd. and tested for use as precursors for the organometallic **CVD** (**OMCVD**) prepn. of TiN, VN, TiC and VC thin-film ceramic materials. Methodologies and main results on thermal analyses and deposit characterization are described.
IT **24646-85-3P**, Vanadium **nitride** VN
25583-20-4P, Titanium **nitride** TiN

(**coatings**; organometallic precursors for **CVD** prepn. of TiN, VN, TiC and VC thin-film ceramic materials)

RN 24646-85-3 HCA
CN Vanadium nitride (VN) (6CI, 8CI, 9CI) (CA INDEX NAME)

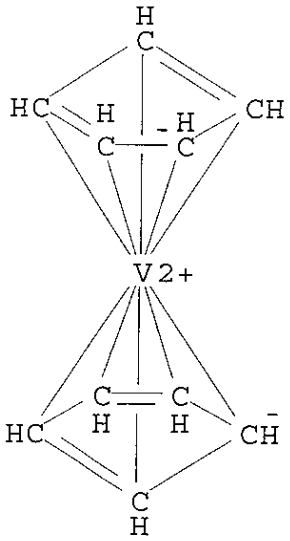
N≡V

RN 25583-20-4 HCA
CN Titanium nitride (TiN) (7CI, 8CI, 9CI) (CA INDEX NAME)

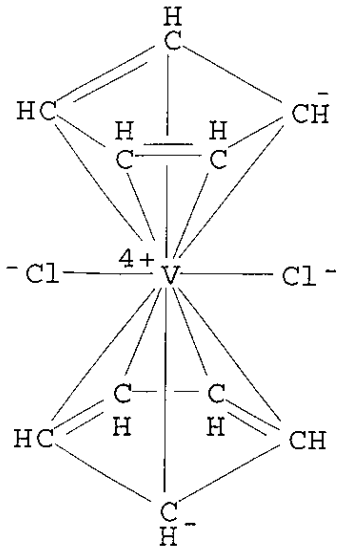
N≡Ti

IT **1277-47-0P**, Vanadocene **12083-48-6P**
12701-79-0P 59139-01-4P 62363-03-5P
(precursors; organometallic precursors for **CVD** prepn. of TiN, VN, TiC and VC thin-film ceramic materials)

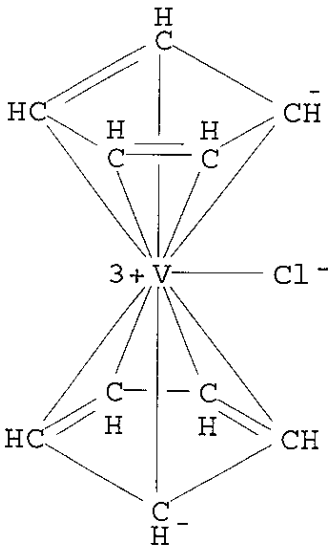
RN 1277-47-0 HCA
CN Vanadocene (9CI) (CA INDEX NAME)



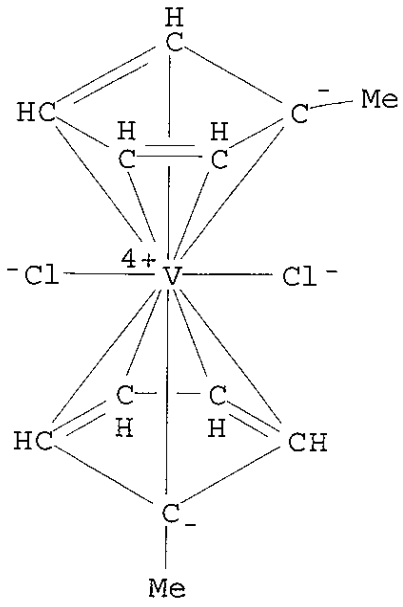
RN 12083-48-6 HCA
CN Vanadium, dichlorobis(.eta.5-2,4-cyclopentadien-1-yl)- (9CI) (CA INDEX NAME)



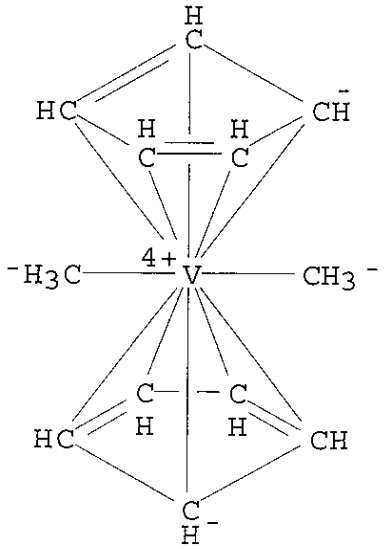
RN 12701-79-0 HCA
CN Vanadium, chlorobis(.eta.5-2,4-cyclopentadien-1-yl)- (9CI) (CA INDEX NAME)



RN 59139-01-4 HCA
CN Vanadium, dichlorobis[(1,2,3,4,5-.eta.)-1-methyl-2,4-cyclopentadien-1-yl]- (9CI) (CA INDEX NAME)



RN 62363-03-5 HCA
CN Vanadium, bis(.eta.5-2,4-cyclopentadien-1-yl)dimethyl- (9CI) (CA INDEX NAME)

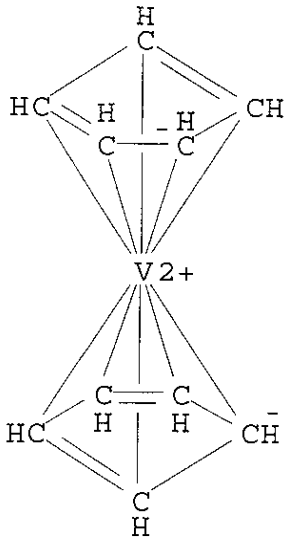


CC 57-2 (Ceramics)
Section cross-reference(s): 29
ST organometallic compd ceramic coating **CVD**; titanium nitride **CVD** organometallic precursor; titanium carbide **CVD** organometallic precursor; vanadium carbide **CVD** organometallic precursor; vanadium nitride **CVD**

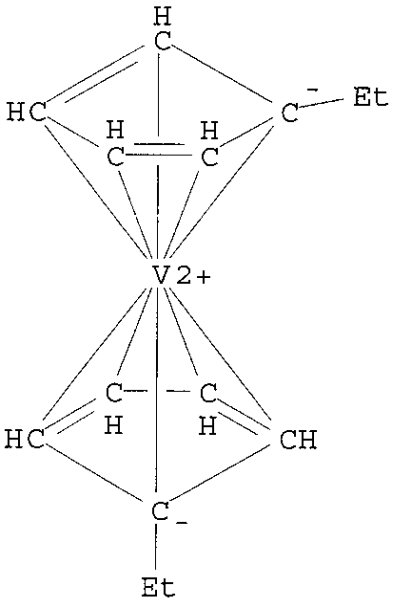
organometallic precursor
IT Vapor deposition processes
(organometallic precursors for **CVD** prepn. of TiN, VN, TiC and VC thin-film ceramic materials)
IT 12070-08-5P, Titanium carbide TiC 12070-10-9P, Vanadium carbide VC **24646-85-3P**, Vanadium **nitride** VN **25583-20-4P**, Titanium **nitride** TiN
(**coatings**; organometallic precursors for **CVD** prepn. of TiN, VN, TiC and VC thin-film ceramic materials)
IT 1270-98-0P 1271-19-8P **1277-47-0P**, Vanadocene 11078-01-6P **12083-48-6P** 12129-51-0P **12701-79-0P** 19824-57-8P 24618-62-0P 52676-23-0P **59139-01-4P** 60955-54-6P **62363-03-5P** 71713-64-9P 71713-68-3P 80545-62-6P 90941-76-7P 99589-88-5P 136762-09-9P 136762-13-5P 157369-02-3P 160261-25-6P
(precursors; organometallic precursors for **CVD** prepn. of TiN, VN, TiC and VC thin-film ceramic materials)

=> d l28 1-16 cbib abs hitstr hitind

L28 ANSWER 1 OF 16 HCA COPYRIGHT 2003 ACS on STN
136:286888 Vapor deposition of metal oxides, silicates and phosphates, and silicon dioxide. Gordon, Roy G.; Becker, Jill; Hausmann, Dennis; Suh, Seigi (President and Fellows of Harward College, USA). PCT Int. Appl. WO 2002027063 A2 20020404, 51 pp. DESIGNATED STATES: W: JP, KR, US; RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR. (English). CODEN: PIXXD2. APPLICATION: WO 2001-US30507 20010928. PRIORITY: US 2000-PV236283 20000928; US 2000-PV253917 20001129.
AB Metal silicates or phosphates are deposited on a heated substrate by the reaction of vapors of alkoxysilanols or alkylphosphates along with reactive metal amides, alkyls or alkoxides. For example, vapors of tris-(ter-butoxy)silanol react with vapors of tetrakis(ethylmethylamido)hafnium to deposit Hf silicate on surfaces heated to 300.degree.. The product film has a very uniform stoichiometry throughout the reactor. Similarly, vapors of diisopropylphosphate react with vapors of Li bis(ethyldimethylsilyl)amide to deposit Li phosphate films on substrates heated to 250.degree.. Supplying the vapors in alternating pulse produces these same compns. with a very uniform distribution of thickness and excellent step coverage.
IT **1277-47-0**, Vanadocene **55940-04-0**
(vapor deposition of metal silicates and phosphates by reacting alkoxysilanol or alkylphosphates with metal or metalloid compd.)
RN 1277-47-0 HCA
CN Vanadocene (9CI) (CA INDEX NAME)



RN 55940-04-0 HCA
CN Vanadocene, 1,1'-diethyl- (9CI) (CA INDEX NAME)



IC ICM C23C016-40
CC 75-1 (Crystallography and Liquid Crystals)
ST atomic **layer** deposition **metal** silicate phosphate oxide silica; **CVD** metal silicate phosphate oxide silica
IT **Vapor deposition** process
(**chem.**; **vapor deposition** of metal silicates and phosphates by reacting alkoxysilanol or alkylphosphates with metal or metalloid compd.)

IT 75-24-1, Trimethylaluminum 121-43-7, Trimethyl borate 506-82-1, Dimethylcadmium 542-63-2, Diethylberyllium 544-97-8, Dimethylzinc 546-68-9, Tetrakis(isopropanolato)titanium 557-20-0, Diethylzinc 593-91-9, Trimethylbismuthine 617-85-6, Triethylstibine 813-78-5 867-97-0, Tris(diethylamino)borane 1066-77-9, Tetrakis(dimethylamino)stannane 1070-89-9, Sodium bis(trimethylsilyl)amide 1271-24-5, Chromocene 1271-86-9 1272-21-5, Tris(.eta.5-cyclopentadienyl)gadolinium 1272-23-7, Tris(.eta.5-cyclopentadienyl)lanthanum 1272-26-0, Tris(.eta.5-cyclopentadienyl)thulium 1273-98-9, Tris(.eta.5-cyclopentadienyl)neodymium 1277-43-6, Cobaltocene **1277-47-0**, Vanadocene 1294-07-1, Tris(.eta.5-cyclopentadienyl)yttrium 1295-20-1, Tris(.eta.5-cyclopentadienyl)ytterbium 1298-53-9, Tris(.eta.5-cyclopentadienyl)cerium 1298-54-0 1298-55-1, Tris(.eta.5-cyclopentadienyl)samarium 1312-81-8, Lanthanum oxide 1316-98-9 1335-30-4, Aluminum Silicate 1445-79-0, Trimethylgallium 1611-31-0 1624-01-7, Tetrakis(dimethylamino)silane 2081-12-1, Tetrakis(tert-butanolato)zirconium 2172-02-3 3236-82-6 3275-24-9, Tetrakis(dimethylamido)titanium 3323-04-4, Bis(bis(trimethylsilyl)amido)cadmium 3385-78-2, Trimethylindium 3999-27-7, Bis(bis(trimethylsilyl)amido)zinc 4039-32-1, Lithium bis(trimethylsilyl)amide 4104-81-8 4375-83-1, Tris(dimethylamino)borane 4419-47-0, Tetrakis(diethylamido)titanium 6074-84-6 6596-96-9, Hexamethylarsenous triamide 7289-92-1 7344-40-3, Tetrakis(dimethylamino)germane 7529-46-6 7529-48-8 7566-57-6 10377-52-3, Lithium Phosphate 11077-59-1, Tris(cyclopentadienyl) praseodymium 12078-25-0, Dicarbonyl(.eta.5-cyclopentadienyl)cobalt 12212-68-9, Bis(ethylbenzene)chromium 12261-30-2 12636-72-5, Bis(.eta.5-cyclopentadienyl)dimethylzirconium 13801-49-5, Tetrakis(diethylamido)zirconium 13859-65-9, Tetrakis(trifluorophosphine)nickel 14096-82-3, Tricarbonyl(nitrosyl)cobalt 14314-61-5 14760-22-6, Bis(bis(trimethylsilyl)amido)iron 15112-89-7, Tris(dimethylamino)silane 15821-76-8 16530-82-8 17048-10-1, Tetrakis(diethylamino)silane 18166-43-3 18741-03-2, Magnesium bis(bis(trimethylsilyl)amide) 19756-04-8, Tetrakis(dimethylamido)zirconium 19782-68-4, Tetrakis(dimethylamido)hafnium 19824-55-6, Tetrakis(diethylamido)hafnium 19824-56-7 19824-57-8 19824-58-9, Pentakis(dimethylamido)niobium 19824-59-0 19824-60-3 19851-68-4, Tris(diisopropylamido)chromium 20302-36-7, Tris(cyclopentadienyl)indium 20607-91-4 21941-96-8, Tetrakis(diethylamino)stannane 22999-67-3, Tris(bis(trimethylsilyl)amido)iron 25169-05-5 25605-37-2 25733-02-2, Beryllium, Bis(bis(trimethylsilyl)amino)- 29865-05-2 31978-09-3, Tetrakis(methylamino)silane 32093-39-3, Hexakis(dimethylamido)dialuminum 32877-00-2, Bis(ethylbenzene)molybdenum 33851-46-6, Tetrakis(dimethylamido)molybdenum 33851-47-7 34822-90-7,

Cyclopentadienyl thallium 35450-28-3,
Tris(bis(trimethylsilyl)amido)gallium 35450-29-4,
Tris(bis(trimethylsilyl)amido)indium 35788-99-9,
Tris(bis(trimethylsilyl)amido)lanthanum 35789-00-5,
Tris(bis(trimethylsilyl)amido)praseodymium 35789-01-6,
Tris(bis(trimethylsilyl)amido)samarium 35789-02-7 35789-03-8
35789-04-9, Tris(bis(trimethylsilyl)amido)lutetium 37512-28-0
37512-29-1, Tris(bis(trimethylsilyl)amido)titanium 37512-30-4,
Tris(bis(trimethylsilyl)amido)vanadium 37512-31-5 38182-82-0,
Tetrakis(diethylamino)germane 38227-87-1 39330-74-0,
Tris(.eta.5-cyclopentadienyl)erbium 40678-58-8,
Tetrakis(diethylamido)thorium 40678-59-9,
Tetrakis(diethylamido)uranium 40949-94-8, Potassium
bis(trimethylsilyl)amide 41836-21-9, Tris(bis(trimethylsilyl)amido
)cerium 41836-23-1, Tris(bis(trimethylsilyl)amido)neodymium
41836-27-5 41836-28-6, Tris(bis(trimethylsilyl)amido)yttrium
41836-29-7, Tris(bis(trimethylsilyl)amido)ytterbium 51956-20-8,
Hexakis(dimethylamido)dimolybdenum 54123-86-3 54935-70-5
55147-59-6, Bis(bis(trimethylsilyl)amino)plumbylene 55147-78-9,
Bis(bis(trimethylsilyl)amino)stannylene 55147-79-0 55147-80-3
55147-81-4 55290-25-0, Bis(bis(trimethylsilyl)amino)germylene
55940-04-0 57088-64-9 57088-65-0 59671-98-6
61361-87-3 61361-88-4 62419-10-7 63084-58-2 63226-58-4
63757-86-8, Magnesium bis(cyclopentadienide) 63833-49-8
63833-51-2 64561-25-7 67313-80-8 67506-86-9 67938-78-7
68136-20-9, Lanthanum Silicate 68193-40-8, Bis(.eta.5-tert-
butylcyclopentadienyl)dimethylzirconium 68959-87-5 69021-85-8
69021-86-9, Tris(isopropylcyclopentadienyl) praseodymium
69927-52-2, Tris(bis(trimethylsilyl)amido)uranium 70309-68-1
72220-23-6 72220-24-7 72260-43-6 73138-26-8,
Bis(.eta.5-cyclopentadienyl)manganese 74507-61-2,
Bis(.eta.5-pentamethylcyclopentadienyl)chromium 75504-17-5
75504-18-6 76505-24-3 84079-75-4 84079-76-5 86563-55-5
91308-30-4 91308-32-6 95029-57-5 96350-48-0 98145-63-2,
Tetrakis(diethylamido)tantalum 101200-05-9 101923-26-6
103457-72-3, Tris(bis(trimethylsilyl)amido)erbium 109433-86-5
112379-48-3 112379-49-4 114460-02-5 114504-74-4 122528-16-9
122676-67-9, Tris(bis(trimethylsilyl)amido)manganese 122676-68-0
123798-11-8 123798-14-1 126970-21-6 128110-72-5, Aluminum
silicon oxide (Al2Si8O19) 130521-76-5 130817-68-4 131297-96-6
131297-97-7, Barium bis(bis(trimethylsilyl)amide) 132644-88-3
133947-38-3 133947-39-4 144356-16-1 153608-51-6 154069-61-1
154294-23-2 156304-61-9, Tris((tert-butyl)(trimethylsilyl)amido)ga
llium 156304-62-0 169896-41-7, (tert-
Butylimido)tris(diethylamido)tantalum 175923-04-3 178881-65-7
180335-73-3 192228-19-6 194611-64-8, Tris(diethylamido)gallium
201233-61-6 201941-77-7 207788-38-3 210758-43-3 218613-11-7,
Yttrium oxide silicate (YO(SiO3)2) 251984-08-4 261929-98-0
300548-71-4 300548-72-5 300585-49-3 300585-58-4 300585-62-0
308847-87-2 312696-25-6 312739-77-8 329735-69-5 329735-72-0
329735-73-1 352535-01-4 404943-68-6 406462-34-8 406462-35-9
406462-36-0 406462-37-1 406462-38-2 406462-39-3 406462-40-6

406462-41-7 406462-42-8 406462-43-9 406462-44-0 406462-45-1
406462-46-2 406462-47-3 406462-48-4 406462-50-8, Aluminum metaphosphate oxide (Al2(PO3)4O) 406462-53-1 406462-54-2
406462-56-4 406462-59-7 406462-61-1 406462-62-2 406462-63-3, Aluminum silicon oxide (Al2Si16O35)
(vapor deposition of metal silicates and phosphates by reacting alkoxysilanol or alkylphosphates with metal or metalloid compd.)

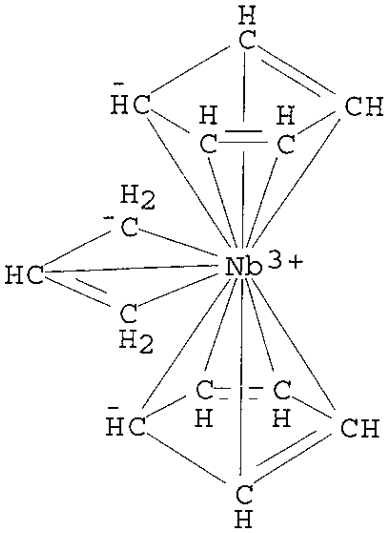
L28 ANSWER 2 OF 16 HCA COPYRIGHT 2003 ACS on STN
132:295699 Manufacture of inorganic composite membranes. Lee, Ku Ho; Jon, Chan Soo (Korea Research Institute of Chemical Technology, Japan). Jpn. Kokai Tokkyo Koho JP 2000117072 A2 20000425, 7 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1999-176090 19990622. PRIORITY: KR 1998-44439 19981019.

AB Organometallic compd. MR1R2 (M = Pd, Nb, Ni; R1 = allyl; R2 = cyclopentadienyl) is deposited on a porous substrate and then the substrate is treated by introduction of a reducing gas on the opposite side of the substrate for formation of a **metal layer** at std. temp. Optionally, 5-30 wt.% MR1R2 may be substituted with Ag(C6H4CH3). The membranes are dense and have excellent gas permeating and mech. characteristics. The membranes show high H/N permeability ratio. The membranes are esp. useful as catalysts for dehydrogenation of org. compds.

IT **39413-65-5**
(std.-temp. manuf. of metal composite membranes for selective N permeation and dehydrogenation catalysts by **MOCVD** followed by redn.)

RN 39413-65-5 HCA

CN Niobium, bis(.eta.5-2,4-cyclopentadien-1-yl)(.eta.3-2-propenyl)-(9CI) (CA INDEX NAME)



IC ICM B01D071-02
ICS B01D053-22; B01D061-14; B01D069-10; B01D069-12

CC 48-1 (Unit Operations and Processes)
Section cross-reference(s): 22, 49, 56, 67, 75
ST **metal layer** std temp deposition; organometallic compd deposition redn membrane prepn; dehydrogenation catalyst inorg composite membrane; selective nitrogen permeation membrane manuf
IT Membranes, nonbiological
(composite; std.-temp. manuf. of metal composite membranes for selective N permeation and dehydrogenation catalysts by **MOCVD** followed by redn.)
IT Vapor deposition process
(metalorg.; std.-temp. manuf. of metal composite membranes for selective N permeation and dehydrogenation catalysts by **MOCVD** followed by redn.)
IT Dehydrogenation catalysts
Reduction
(std.-temp. manuf. of metal composite membranes for selective N permeation and dehydrogenation catalysts by **MOCVD** followed by redn.)
IT 12726-60-2P
(nickel-coated porous stainless steel substrate for deposition of metals; std.-temp. manuf. of metal composite membranes for selective N permeation and dehydrogenation catalysts by **MOCVD** followed by redn.)
IT 7440-02-0, Nickel, processes
(nickel-coated porous stainless steel substrate for deposition of metals; std.-temp. manuf. of metal composite membranes for selective N permeation and dehydrogenation catalysts by **MOCVD** followed by redn.)
IT 1344-28-1, Alumina, processes 12597-68-1, Stainless steel, processes
(porous substrate for deposition of metals; std.-temp. manuf. of metal composite membranes for selective N permeation and dehydrogenation catalysts by **MOCVD** followed by redn.)
IT 7440-37-1, Argon, uses
(redn. in hydrogen mixt. with; std.-temp. manuf. of metal composite membranes for selective N permeation and dehydrogenation catalysts by **MOCVD** followed by redn.)
IT 1333-74-0, Hydrogen, processes
(redn. in; std.-temp. manuf. of metal composite membranes for selective N permeation and dehydrogenation catalysts by **MOCVD** followed by redn.)
IT 7440-05-3P, Palladium, uses
(std.-temp. manuf. of metal composite membranes for selective N permeation and dehydrogenation catalysts by **MOCVD** followed by redn.)
IT 7727-37-9, Nitrogen, miscellaneous
(std.-temp. manuf. of metal composite membranes for selective N permeation and dehydrogenation catalysts by **MOCVD** followed by redn.)
IT 1271-03-0, Allylcyclopentadienylpalladium 12107-46-9, Allylcyclopentadienylnickel **39413-65-5** 264925-81-7
(std.-temp. manuf. of metal composite membranes for selective N

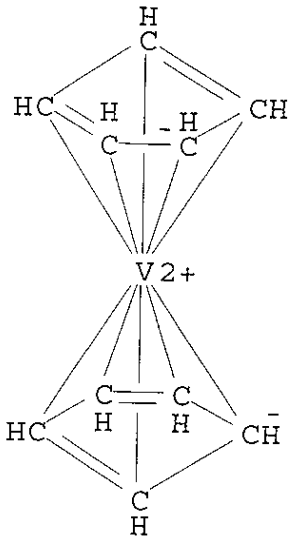
permeation and dehydrogenation catalysts by **MOCVD** followed by redn.)

L28 ANSWER 3 OF 16 HCA COPYRIGHT 2003 ACS on STN
130:269685 Plasma enhanced **chemical vapor deposition** of forming **vanadium** oxide **films** for lithium rechargeable batteries. Zhang, Ji-Guang; Tracy, C. Edwin; Benson, David K.; Turner, John A.; Liu, Ping (Midwest Research Institute, USA). PCT Int. Appl. WO 9919534 A1 19990422, 29 pp. DESIGNATED STATES: W: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, GM, HR, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, UZ, VN, YU, ZW; RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE. (English). CODEN: PIXXD2. APPLICATION: WO 1998-US21434 19981009. PRIORITY: US 1997-948832 19971010.

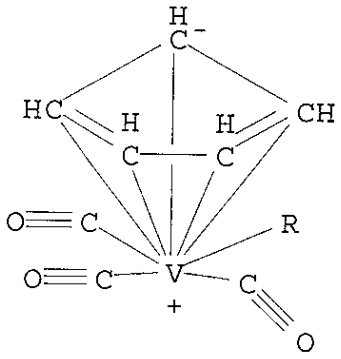
AB A method is disclosed of forming a **vanadium** oxide **film** on a substrate utilizing plasma enhanced **chem**. **vapor deposition**. The method includes positioning a substrate within a plasma reaction chamber and then forming a precursor gas comprised of a vanadium-contg. chloride gas in an inert carrier gas. This precursor gas is then mixed with selected amts. of hydrogen and oxygen and directed into the reaction chamber. The amts. of precursor gas, oxygen and hydrogen are selected to optimize the final properties of the **vanadium** oxide **film**. An rf plasma is generated within the reaction chamber to chem. react the precursor gas with the hydrogen and the oxygen to cause deposition of a **vanadium** oxide **film** on the substrate while the chamber deposition pressure is maintained at about one torr or less. Finally, the byproduct gases are removed from the plasma reaction chamber.

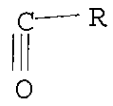
IT **1277-47-0**, Vanadocene **12108-04-2**, Cyclopentadienyl vanadium tetracarbonyl
(plasma enhanced **chem. vapor deposition** of forming **vanadium** oxide **films** for lithium rechargeable batteries)

RN 1277-47-0 HCA
CN Vanadocene (9CI) (CA INDEX NAME)



RN 12108-04-2 HCA
CN Vanadium, tetracarbonyl(.eta.5-2,4-cyclopentadien-1-yl)- (9CI) (CA INDEX NAME)





IC ICM C23C016-40
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST lithium battery cathode **vanadium** oxide **film**; plasma **CVD vanadium** oxide **film** battery
IT Secondary batteries
(lithium; plasma enhanced **chem. vapor deposition** of forming **vanadium** oxide **films** for lithium rechargeable batteries)
IT Battery cathodes

(plasma enhanced **chem. vapor deposition** of forming **vanadium** oxide **films** for lithium rechargeable batteries)

IT Vapor deposition process
(plasma; plasma enhanced **chem. vapor deposition** of forming **vanadium** oxide **films** for lithium rechargeable batteries)

IT Metal alkoxides
(vanadyl; plasma enhanced **chem. vapor deposition** of forming **vanadium** oxide **films** for lithium rechargeable batteries)

IT **1277-47-0**, Vanadocene 1333-74-0, Hydrogen, reactions 7632-51-1, Vanadium tetrachloride 7718-98-1, Vanadium trichloride 7727-18-6 7782-44-7, Oxygen, reactions 10049-12-4, Vanadium trifluoride 10049-16-8, Vanadium tetrafluoride **12108-04-2**, Cyclopentadienyl vanadium tetracarbonyl 13470-26-3, Vanadium tribromide 13476-99-8 13520-90-6, Vanadium oxybromide vobr3 13595-30-7, Vanadium tetrabromide 13709-31-4, Vanadium oxyfluoride vof3 14024-00-1, Vanadium hexacarbonyl 15513-94-7, Vanadium triiodide 15831-18-2, Vanadium tetraiodide
(plasma enhanced **chem. vapor deposition** of forming **vanadium** oxide **films** for lithium rechargeable batteries)

IT 1314-62-1P, Vanadium oxide v2o5, preparation 12036-21-4P, Vanadium oxide vo2 12037-42-2P, Vanadium oxide v6o13
(plasma enhanced **chem. vapor deposition** of forming **vanadium** oxide **films** for lithium rechargeable batteries)

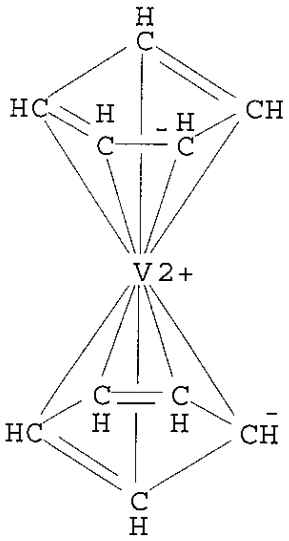
IT 7440-37-1, Argon, uses
(plasma enhanced **chem. vapor deposition** of forming **vanadium** oxide **films** for lithium rechargeable batteries)

L28 ANSWER 4 OF 16 HCA COPYRIGHT 2003 ACS on STN
129:292885 Specific features induced by the vaporization of solid organometallic compounds used as **OMCVD** precursors for deposition in the V-C-N chemical system. Teyssandier, F.; Poirier, L.; Slifirski, J.; Valade, L.; Danjoy, C.; Reynes, A.; Jauberteau, J. L.; Sibieude, F. (IMP-CNRS-UPR8521, Universite, Perpignan, 66860, Fr.). Annales de Chimie (Paris), 23(5-6), 655-666 (French) 1998. CODEN: ANCPAC. ISSN: 0151-9107. Publisher: Editions Scientifiques et Medicales Elsevier.

AB The pyrolysis behaviors of titanocene dichloride and vanadocene used as a precursor for the **chem. vapor deposition** of titanium carbide and vanadium carbide, resp., are studied. The influence of the gas-phase transport of these compds. on the properties of the deposits is also discussed according to the vaporization procedure.

IT **1277-47-0**, Vanadocene
(precursor; specific features induced by vaporization of solid organometallic compds. used as **OMCVD** precursors for deposition in V-C-N chem. system)

RN 1277-47-0 HCA
CN Vanadocene (9CI) (CA INDEX NAME)



CC 57-2 (Ceramics)
ST titanocene dichloride precursor vaporization **CVD** carbide; vaporization organometallic precursor **CVD** carbide coating; vanadocene precursor vaporization **CVD** carbide
IT Vapor deposition process
(metalorg.; specific features induced by vaporization of solid organometallic compds. used as **OMCVD** precursors for deposition in V-C-N chem. system)
IT Evaporation
Thermal decomposition
(specific features induced by vaporization of solid organometallic compds. used as **OMCVD** precursors for deposition in V-C-N chem. system)
IT Organometallic compounds
(specific features induced by vaporization of solid organometallic compds. used as **OMCVD** precursors for deposition in V-C-N chem. system)
IT 12070-08-5, Titanium carbide 12070-10-9, **Vanadium** carbide
(**coatings**; specific features induced by vaporization of solid organometallic compds. used as **OMCVD** precursors for deposition in V-C-N chem. system)
IT 1271-19-8, Titanocene dichloride **1277-47-0**, Vanadocene
(precursor; specific features induced by vaporization of solid organometallic compds. used as **OMCVD** precursors for deposition in V-C-N chem. system)

L28 ANSWER 5 OF 16 HCA COPYRIGHT 2003 ACS on STN
128:247382 Ceramic **coating** of **metal** tube inner surfaces by **OMCVD**. Poirier, Laurent; Wang, Yun Biao;

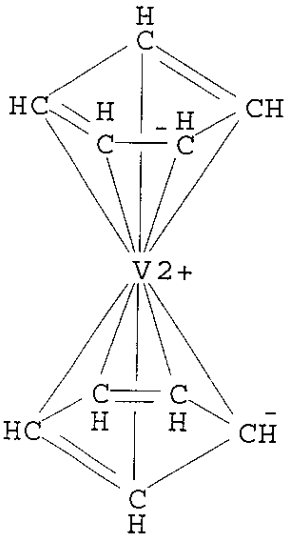
Ducarroir, Michel; Teyssandier, Francis (Institut de Science et de Genie des Materiaux et Procedes, CNRS-UPR8521, Universite, Perpignan, F-66860, Fr.). Proceedings - Electrochemical Society, 97-25(Chemical Vapor Deposition), 425-432 (English) 1997. CODEN: PESODO. ISSN: 0161-6374. Publisher: Electrochemical Society.

AB The great versatility of the **CVD** process shows to coat parts presenting complex shapes. The purpose of this paper is to show the feasibility of the inner **coating** of **metal** tubes from organometallic precursors by the use of a device specifically designed for that purpose. The paper reports on both theor. optimization of the device by simulation modeling and exptl. results.

IT **1277-47-0**, Vanadocene
(precursor; **CVD** of ceramic coatings on inner surfaces of metal tubes by **CVD** using organometallic precursors)

RN 1277-47-0 HCA

CN Vanadocene (9CI) (CA INDEX NAME)



CC 57-2 (Ceramics)
Section cross-reference(s): 55, 56

ST **CVD** ceramic **coating metal** tube

IT Ceramic coatings
(**CVD** of ceramic coatings on inner surfaces of metal tubes by **CVD** using organometallic precursors)

IT **Vapor deposition** process
(**chem.**, organometallic; **CVD** of ceramic coatings on inner surfaces of metal tubes by **CVD** using organometallic precursors)

IT Pipes and Tubes
(metal; **CVD** of ceramic coatings on inner surfaces of metal tubes by **CVD** using organometallic precursors)

IT 12070-10-9P, **Vanadium** carbide vc
(**coatings**; **CVD** of ceramic coatings on inner

surfaces of metal tubes by **CVD** using organometallic precursors)

IT **1277-47-0**, Vanadocene
(precursor; **CVD** of ceramic coatings on inner surfaces of metal tubes by **CVD** using organometallic precursors)

IT 12597-69-2, Steel, processes
(tubes; **CVD** of ceramic coatings on inner surfaces of metal tubes by **CVD** using organometallic precursors)

L28 ANSWER 6 OF 16 HCA COPYRIGHT 2003 ACS on STN

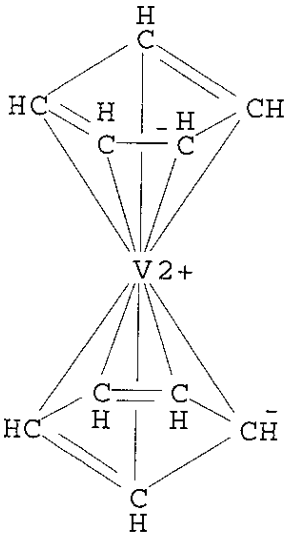
125:128124 Plasma-enhanced **CVD** of vanadium carbide VC1-x and VOx from vanadocene Cp2V. Deutschmann, Lutz; Messelhaeuser, Johannes; Suhr, Harald; Herrmann, Wolfgang A.; Haerter, Peter (Dep. Chem., Univ. Tuebingen, Tuebingen, 72076, Germany). Advanced Materials (Weinheim, Germany), 6(5), 392-5 (English) 1994. CODEN: ADVMEW. ISSN: 0935-9648. Publisher: VCH.

AB The plasma-enhanced **CVD** of VOx, VC1-x, and VOxCy films using vanadocene as precursor is reported. Using Ar/H (1:1) plasma for the deposition of VC led to dark films indicating polymn. during the process. Using pure H as carrier gas no polymeric C was formed, but oxide was indicated. O sources are leaks in the reactor. The O concn. was decreased by increasing H flow. After sputtering 20 min. the peaks of VC dominate. The resistivity of the films decreased by 1 order of magnitude to 104 .mu..OMEGA. cm. Using the air from the leak with an Ar/H mixt. VC0.24O1.59 was obtained. The films had resistivities of 5 .times. 103 .mu..OMEGA. cm. After heating needle-like crystallites occurred, which could not be attributed to a known phase of VOx.

IT **1277-47-0**, Vanadocene
(plasma-enhanced **CVD** of VC1-x, VOx, and VOxCy films from)

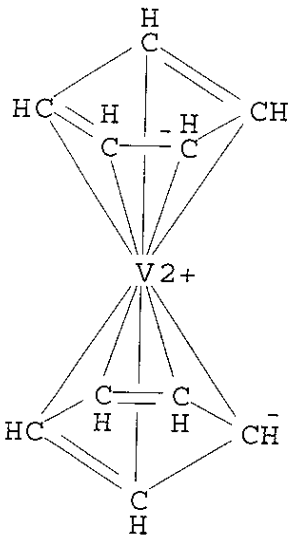
RN 1277-47-0 HCA

CN Vanadocene (9CI) (CA INDEX NAME)



CC 75-1 (Crystallography and Liquid Crystals)
Section cross-reference(s): 76
ST plasma **CVD** vanadium carbide oxide vanadocene; elec resistivity **CVD** vanadium carbide oxide
IT Electric resistance
(of vanadium oxide, vanadium carbide and **vanadium** carbide oxide **films** grown by **CVD** using vanadocene)
IT Vapor deposition processes
(plasma, of vanadium oxide, vanadium carbide and **vanadium** carbide oxide **films** from vanadocene)
IT 11099-11-9, Vanadium oxide 12070-10-9D, Vanadium carbide (VC), carbide-deficient 179422-15-2, Vanadium carbide oxide (VC0.24O1.59)
(plasma-enhanced **CVD** of VC1-x, VOx, and VOxCy films from)
IT **1277-47-0**, Vanadocene
(plasma-enhanced **CVD** of VC1-x, VOx, and VOxCy films from)

L28 ANSWER 7 OF 16 HCA COPYRIGHT 2003 ACS on STN
124:72002 **Vanadium** oxycarbide **coatings** deposited by **OMCVD** in an isothermal reactor. Poirier, L.; Teyssandier, F. (Institut de Science et de Genie des Materiaux et Procedes, UPR 8521 du CNRS, Perpignan, 66860, Fr.). Journal de Physique IV, 5(C5, Chemical Vapour Deposition, Vol. 1), C5-473-C5-480 (English) 1995. CODEN: JPICEI. ISSN: 1155-4339. Publisher: Editions de Physique.
AB This paper reports on the influence of both the vaporization mechanism and gaseous transport phenomena on the properties of **V** oxycarbide **coatings**. To study the influence of the residence time of the gaseous mixt. on the properties of the deposited layer, a specific device was built. In this device the temp. of the reactor wall is very accurately controlled to the vaporization temp. of the precursor by a heat pipe disposed inside a furnace, whereas the temp. of the substrate is imposed independently. A vacuum-tight sliding device allowed varying the length between the vaporization crucible and the deposition substrate. A complete factorial design with three factors and two levels, was carried out for two characteristic vaporization temps. of the precursor. The authors studied the influence of three parameters on the thickness and compn. of the deposits: the substrate temp., the H flow rate, and the distance between the vaporization crucible and the steel substrate.
IT **1277-47-0**, Vanadocene
(influence of vaporization mechanism and gaseous transport phenomena on properties of **vanadium** oxycarbide **coatings**)
RN 1277-47-0 HCA
CN Vanadocene (9CI) (CA INDEX NAME)



CC 75-1 (Crystallography and Liquid Crystals)
Section cross-reference(s): 42, 48
ST vanadium carbide oxide **CVD** vanadocene
IT Surface structure
Vapor deposition processes
(influence of vaporization mechanism and gaseous transport phenomena on properties of **vanadium** oxycarbide **coatings**)
IT 1333-74-0, Hydrogen, processes
(carrier gas; influence of vaporization mechanism and gaseous transport phenomena on properties of **vanadium** oxycarbide **coatings**)
IT 7440-44-0, Carbon, uses
(influence of vaporization mechanism and gaseous transport phenomena on properties of **vanadium** oxycarbide **coatings**)
IT 39455-49-7P, Vanadium carbide oxide
(influence of vaporization mechanism and gaseous transport phenomena on properties of **vanadium** oxycarbide **coatings**)
IT **1277-47-0**, Vanadocene 7782-44-7, Oxygen, reactions
(influence of vaporization mechanism and gaseous transport phenomena on properties of **vanadium** oxycarbide **coatings**)

L28 ANSWER 8 OF 16 HCA COPYRIGHT 2003 ACS on STN
122:297023 Arene-transition metal complexes as precursors of hard coatings prepared by the **chemical vapor deposition** technique. Hanko, K.; Vass, G.; Szepes, L. (Department of General and Inorganic Chemistry, Eoetvoes Lorand University, Pazmany P. setany 2, Budapest, 1117, Hung.). Journal of Organometallic Chemistry, 492(2), 235-9 (English) 1995. CODEN:

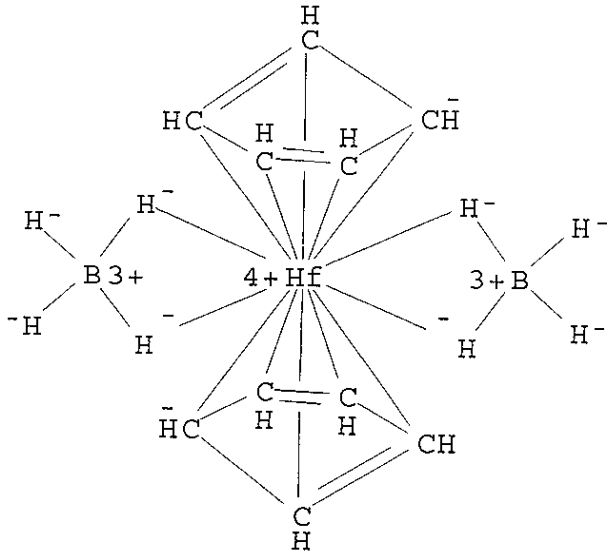
JORCAI. ISSN: 0022-328X. Publisher: Elsevier.

AB Chem. aspects of hard coating prepn. by **chem. vapor deposition** were studied at 300-600.degree.C using bis(arene)chromium and (cyclopentadienyl)zirconium or hafnium tetrahydroborate compds. as precursors. Chromium carbide was deposited from bis(benzene)chromium (I), bis(toluene)chromium (II) and bis(p-xylene)chromium (III). In another set of expts., thin films of zirconium carbide-boride and zirconium and hafnium carbide from (cyclopentadienyl)zirconium tris(tetrahydroborate) (IV) bis(cyclopentadienyl)zirconium bis(tetrahydroborate) (V) and bis(cyclopentadienyl)hafnium bis(tetrahydroborate) (VI) were prepd. In both cases mass spectrometry fragmentation patterns have been invoked to rationalize trends in the deposition temp. and chem. compn. of the obtained thin films.

IT **56420-26-9**
(precursors; **CVD** prepn. of hard ceramic coatings from arene-transition metal complexes and (cyclopentadienyl)zirconium or hafnium tetrahydroborate compds. as precursors)

RN 56420-26-9 HCA

CN Hafnium, bis(.eta.5-2,4-cyclopentadien-1-yl)bis[tetrahydroborato(1-)-H,H']- (9CI) (CA INDEX NAME)



CC 57-2 (Ceramics)

IT Vapor deposition processes
(**CVD** prepn. of hard ceramic coatings from arene-transition metal complexes and (cyclopentadienyl)zirconium or hafnium tetrahydroborate compds. as precursors)

IT Ceramic materials and wares
(coatings, **CVD** prepn. of hard ceramic coatings from arene-transition metal complexes and (cyclopentadienyl)zirconium or hafnium tetrahydroborate compds. as precursors)

IT 11129-37-6P, **Hafnium** carbide 11130-49-7P, Chromium

carbide 12741-10-5P, Zirconium boride 51680-56-9P, Zirconium carbide
(**coatings**; **CVD** prepn. of hard ceramic coatings from arene-transition metal complexes and (cyclopentadienyl)zirconium or hafnium tetrahydroborate compds. as precursors)

IT 1271-54-1, Bis(benzene)chromium 12083-77-1 12087-58-0, Bis(toluene)chromium 12092-22-7, Bis(p-xylene)chromium **56420-26-9** 130087-43-3
(precursors; **CVD** prepn. of hard ceramic coatings from arene-transition metal complexes and (cyclopentadienyl)zirconium or hafnium tetrahydroborate compds. as precursors)

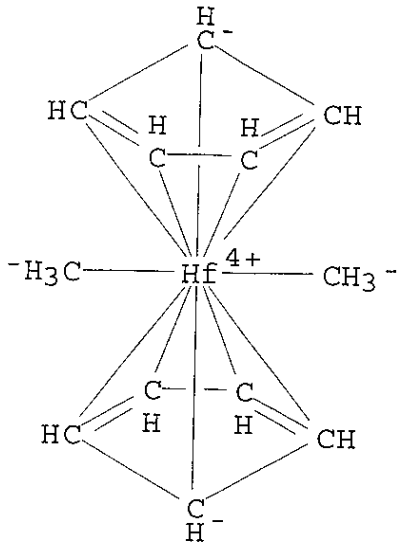
L28 ANSWER 9 OF 16 HCA COPYRIGHT 2003 ACS on STN
122:278441 Formation of **hafnium** carbide thin **films** by plasma enhanced **chemical vapor deposition** from bis(.eta.-cyclopentadienyl)dimethylhafnium as precursor. Spatenka, P.; Suhr, H.; Erker, G.; Rump, M. (Institut fuer Organische Chemie, Universitaet Tuebingen, Tuebingen, D-72076, Germany). Applied Physics A: Materials Science & Processing, A60(3), 285-8 (English) 1995. CODEN: APAMFC. Publisher: Springer.

AB Thin **films** of **Hf** carbide were deposited by plasma-enhanced **CVD** using bis(.eta.-cyclopentadienyl)dimethylhafnium, Cp2HfMe2, as precursor in 13.56 MHz planar reactor. The influence of the various exptl. parameters on film properties was studied. The C content ranged from 11 to 40% and increased with the deposition rate. The film hardness varied between 1300 and 2000 HK. Depending on the C content and power delivered in the discharge, the film resistivity and film d. ranged from 271 to 105 .mu..OMEGA. cm and from 3.4 to 10.4 g/cm3, resp., and the film compn. varied from HfC to Hf contg. a-C:H films.

IT **37260-88-1**, Bis(.eta.-cyclopentadienyl)dimethylhafnium
(formation of **hafnium** carbide thin **films** by plasma enhanced **chem. vapor deposition** from decompn. of)

RN 37260-88-1 HCA

CN Hafnium, bis(.eta.5-2,4-cyclopentadien-1-yl)dimethyl- (9CI) (CA INDEX NAME)



CC 75-1 (Crystallography and Liquid Crystals)
Section cross-reference(s): 29
ST **CVD** plasma hafnium carbide cyclopentadienyldimethylhafnium decompn
IT Electric resistance
(of **hafnium** carbide thin **films** grown by **CVD** from bis(.eta.-cyclopentadienyl)dimethylhafnium as precursor)
IT Vapor deposition processes
(plasma, of **hafnium** carbide thin **films** from bis(.eta.-cyclopentadienyl)dimethylhafnium as precursor)
IT 11129-37-6, Hafnium carbide 12069-85-1, Hafnium carbide
(formation of **hafnium** carbide thin **films** by plasma enhanced **chem. vapor deposition** from bis(.eta.-cyclopentadienyl)dimethylhafnium as precursor)
IT **37260-88-1**, Bis(.eta.-cyclopentadienyl)dimethylhafnium
(formation of **hafnium** carbide thin **films** by plasma enhanced **chem. vapor deposition** from decompn. of)

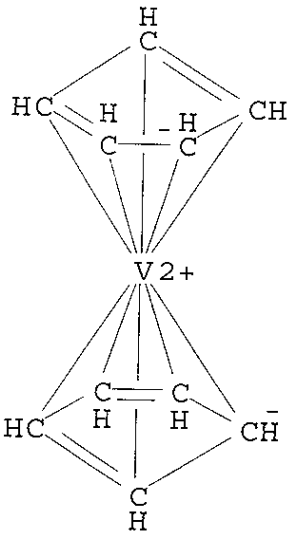
L28 ANSWER 10 OF 16 HCA COPYRIGHT 2003 ACS on STN
121:211147 Vanadocene used as a precursor for the **chemical vapor deposition** of vanadium carbide at atmospheric pressure. Poirier, L.; Richard, O.; Ducarroir, M.; Nadal, M.; Teyssandier, F.; Laurent, F.; Cyr-Athis, O.; Choukroun, R.; Valade, L.; et al. (GIAT Industries, 7 route de Guerry, Bourges, F-18023, Fr.). Thin Solid Films, 249(1), 62-9 (English) 1994. CODEN: THSFAP. ISSN: 0040-6090.
AB From thermal behavior investigations, vanadocene Cp2V (Cp = C5H5) may be proposed as an interesting precursor for **chem**.

vapor deposition of vanadium carbide. The pyrolysis of this compd. allowed us to deposit crystd. vanadium carbide on a steel substrate at temps. down to 973K in a cold wall reactor. Deposits were characterized by X-ray diffraction and electron probe microanal. with wavelength dispersive spectroscopy. The effects of substrate temp., hydrogen carrier gas flow rate, and distance between the substrate and the precursor handling crucible on the deposition rate, grain size and compn. of the deposits were investigated by exptl. design. The residence time of the gaseous species in the reactor was found to be an important factor, leading to a max. of the deposition rate.

IT **1277-47-0**, Vanadocene
(precursor; vanadocene used as a precursor for the **chem**. **vapor deposition** of vanadium carbide at atm. pressure)

RN 1277-47-0 HCA

CN Vanadocene (9CI) (CA INDEX NAME)



CC 57-2 (Ceramics)
Section cross-reference(s): 55

ST vanadocene precursor vanadium carbide **CVD**

IT Vapor deposition processes
(vanadocene used as a precursor for the **chem**. **vapor deposition** of vanadium carbide at atm. pressure)

IT 12070-10-9P, **Vanadium** carbide vc
(**coatings**; vanadocene used as a precursor for the **chem**. **vapor deposition** of vanadium carbide at atm. pressure)

IT **1277-47-0**, Vanadocene
(precursor; vanadocene used as a precursor for the **chem**. **vapor deposition** of vanadium carbide at atm. pressure)

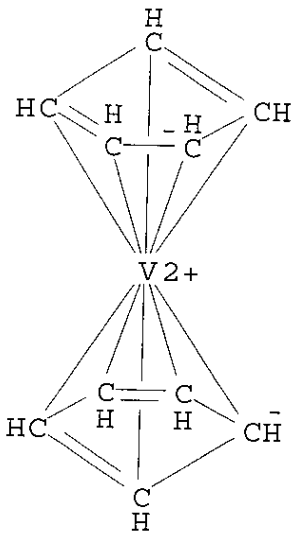
IT 39370-52-0, Aisi 4135, uses
(substrates; vanadocene used as a precursor for the **chem**
. **vapor deposition** of vanadium carbide at
atm. pressure)

L28 ANSWER 11 OF 16 HCA COPYRIGHT 2003 ACS on STN
120:251347 **Vanadium** carbide **films** produced by
plasma-assisted metal-organic **chemical vapor**
deposition. Berndt, H.; Zeng, A. Q.; Stock, H. R.; Mayr, P.
(Guangzhou Res. Inst. Non-ferrous Met., Wushan, Peop. Rep. China).
Journal de Physique IV: Proceedings, 3(C3, Proceedings of the Ninth
European Conference on Chemical Vapour Deposition, 1993), 313-20
(English) 1993. CODEN: JPICEI. ISSN: 1155-4339.

AB **Vanadium** carbide **films** as wear-resistant
coatings produced by salt bath immersion at high temps. have found
wide technol. application in manufg. industries. To reduce the
substrate temp., the deposition of VC-films by plasma-assisted
chem. vapor deposition using a
metal-org. compd. as precursor was investigated.
Bis(cyclopentadienyl)-vanadium, a purple solid compd. showing a
sufficient sublimation rate at relatively low evaporator temps., was
used together with hydrogen and argon to deposit VC-films in a d.c.
glow discharge. As one of the most important parameters, the
substrate temp. was varied from 200 .degree.C to 400 .degree.C. The
compd. decompd. into films and gaseous byproducts like C5H6 and
other hydrocarbons which could be detected by quadrupole mass
spectrometer. The deposition efficiency of the coatings was almost
independent of the substrate temp. It was established by means of
EDX and XRD that cubic **vanadium** carbide **coatings**
were obtained. The morphol. of these layers was examd. by SEM. In
the entire temp. range dense, polycryst. layers were created, whose
hardness measured between 2200-3300 HV. With the increase of the
substrate temp. the adhesive strength of the coatings increased,
too.

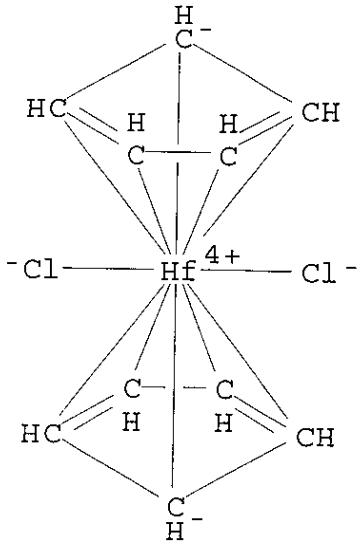
IT **1277-47-0**, Bis(cyclopentadienyl)vanadium
(**chem. vapor deposition** of vanadium
carbide from precursor of)

RN 1277-47-0 HCA
CN Vanadocene (9CI) (CA INDEX NAME)

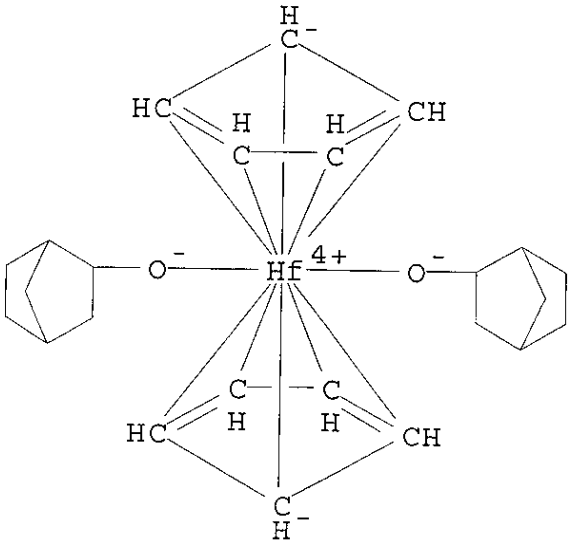


CC 57-2 (Ceramics)
ST vanadium carbide **CVD** organometallic precursor; cyclopentadienyl vanadium precursor **CVD** carbide
IT **1277-47-0**, Bis(cyclopentadienyl)vanadium
(**chem. vapor deposition** of vanadium carbide from precursor of)
IT 12070-10-9, Vanadium carbide
(**chem. vapor deposition** of, from organometallic precursor)

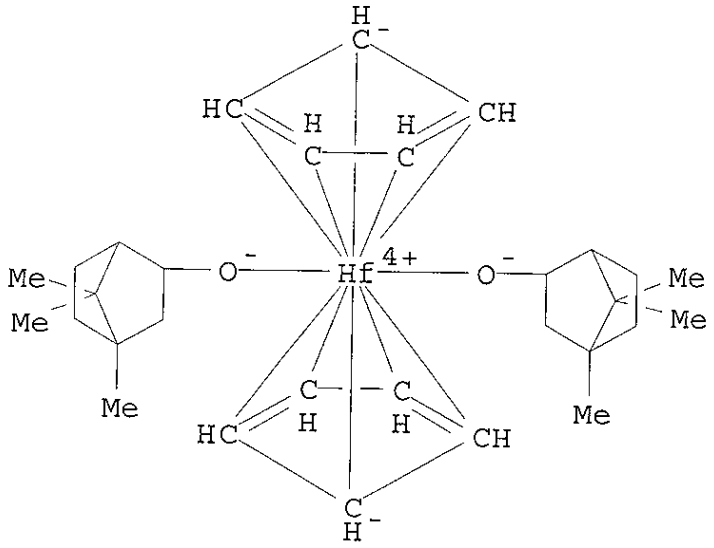
L28 ANSWER 12 OF 16 HCA COPYRIGHT 2003 ACS on STN
119:49516 Mass-spectrometric studies of some new hafnocene dialcoholates. Grafov, A. V.; Favretto, Donata; Traldi, Pietro; Battiston, Giovanni A.; Porchia, Marina; Rossetto, Gilberto; Zanella, Pierino (Inst. Gen. Inorg. Chem., Kiev, Ukraine). Rapid Communications in Mass Spectrometry, 7(2), 158-62 (English) 1993. CODEN: RCMSEF. ISSN: 0951-4198.
AB The electron ionization mass spectrometric behavior of a new class of hafnocene dialcoholates, e.g., CpHf(endo-NBL)2 [endo-HNBL = (+)-endo-norborneol] and, for comparison, of hafnocene dichloride, is discussed. They are also compared on the basis of mass-analyzed ion kinetic energy spectrometry. Fragmentation patterns of oxygen-contg. species give relevant information on their potential as precursors for the deposition of HfO2 thin **films** via **metal**-org. **chem. vapor deposition**.
IT **12116-66-4 148448-29-7 148448-30-0 148448-31-1 148554-44-3**
(mass spectra of)
RN 12116-66-4 HCA
CN Hafnium, dichlorobis(.eta.5-2,4-cyclopentadien-1-yl)- (9CI) (CA INDEX NAME)



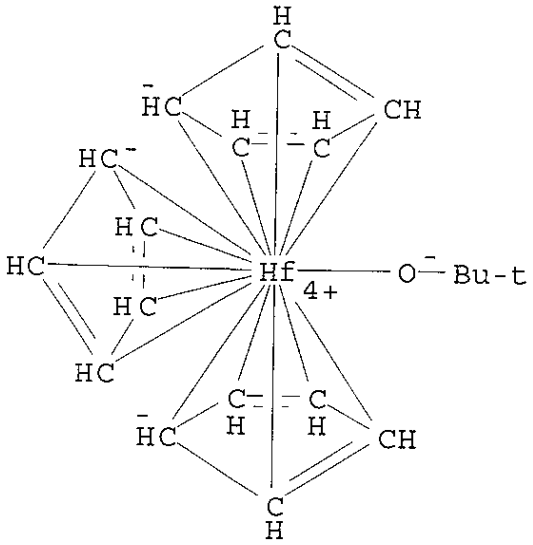
RN 148448-29-7 HCA
CN Hafnium, bis[(1S,2R,4R)-bicyclo[2.2.1]heptan-2-olato]bis(.eta.5-2,4-cyclopentadien-1-yl)- (9CI) (CA INDEX NAME)



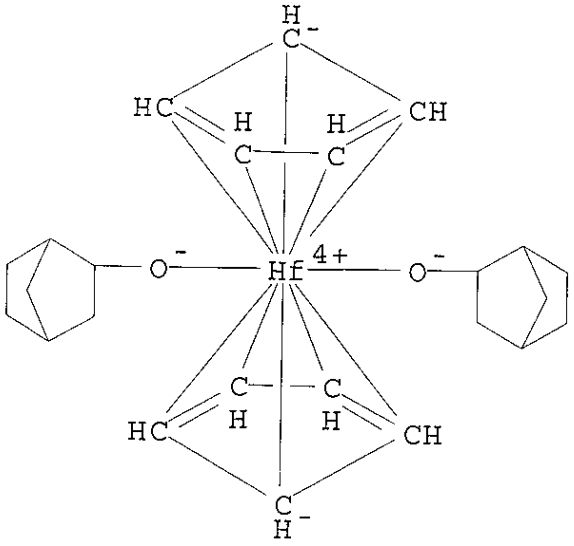
RN 148448-30-0 HCA
CN Hafnium, bis(.eta.5-2,4-cyclopentadien-1-yl)bis(1,7,7-trimethylbicyclo[2.2.1]heptan-2-olato)-, [1S-[1.alpha.,2.beta.(1R*,2S*,4S*),4.alpha.]]- (9CI) (CA INDEX NAME)



RN 148448-31-1 HCA
CN Hafnium, tris(.eta.5-2,4-cyclopentadien-1-yl)(2-methyl-2-propanolato)- (9CI) (CA INDEX NAME)



RN 148554-44-3 HCA
CN Hafnium, bis[(1R,2R,4S)-bicyclo[2.2.1]heptan-2-olato]bis(.eta.5-2,4-cyclopentadien-1-yl)- (9CI) (CA INDEX NAME)

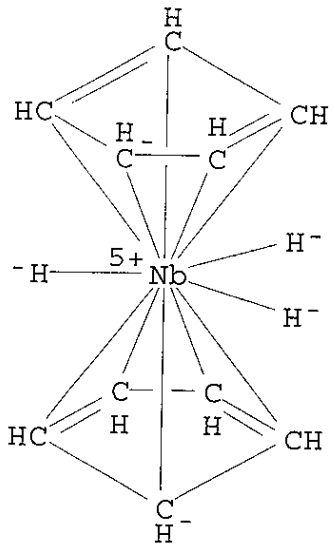


CC 29-10 (Organometallic and Organometalloidal Compounds)
Section cross-reference(s): 22, 73
ST MIKE hafnocene dialcoholate; **MOCVD** mass spectra hafnocene dialcoholate
IT **12116-66-4 148448-29-7 148448-30-0 148448-31-1 148554-44-3**
(mass spectra of)

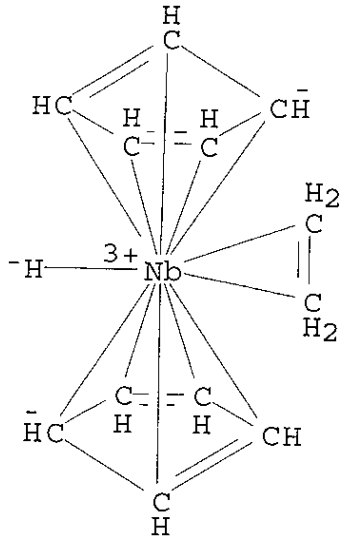
L28 ANSWER 13 OF 16 HCA COPYRIGHT 2003 ACS on STN
118:259466 Low-temperature **chemical vapor deposition** or laser photodeposition of metals on substrates by using organometallic compounds. Hicks, Robert F.; Kaesz, Herbert D.; Xu, Dagiang (University of California, Berkeley, USA). U.S. US 5130172 A 19920714, 8 pp. Cont.-in-part of U.S. Ser. No. 260,799, abandoned. (English). CODEN: USXXAM. APPLICATION: US 1989-428245 19891026. PRIORITY: US 1988-260799 19881021.
AB Metals are deposited on Si or W substrates at .apprx.20-.ltoreq.190.degree. by using organometallic compd. LnMRm in presence of H. L in the compd. is H, ethylene, allyl, methylallyl, butadienyl, pentadienyl, cyclopentadienyl, methylcyclopentadienyl, cyclohexadienyl, hexadienyl, cycloheptatrienyl, or a deriv. of these compds. having .gtoreq.1 C5 alkyl side chain; M is a metal that can readily cycle between 2 oxidn. states and can catalyze hydrogenation of hydrocarbon ligands of the compd.; R is Me, Et, Pr, or Bu; and n and m are each a no. from 0 to the valence of the metal. The compd. is vaporized at .apprx.20-100.degree.. M is selected from the group of metals having at. no. 22-29, 40-47, and 72-79 or 25-29, 42-47, and 74-79 or Co, Rh, Ir, Ni, Pd, Pt, Cu, Ag, Au, and W.
IT **11105-67-2 11105-70-7 12117-02-1 12146-93-9 37298-41-2 39413-65-5 54111-39-6**

(for **chem. vapor deposition** at low temps., on silicon or tungsten)

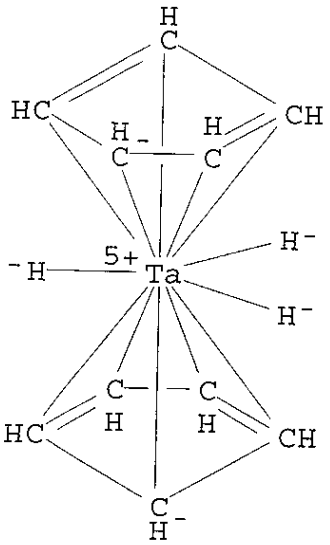
RN 11105-67-2 HCA
CN Niobium, bis(.eta.5-2,4-cyclopentadien-1-yl)trihydro- (9CI) (CA INDEX NAME)



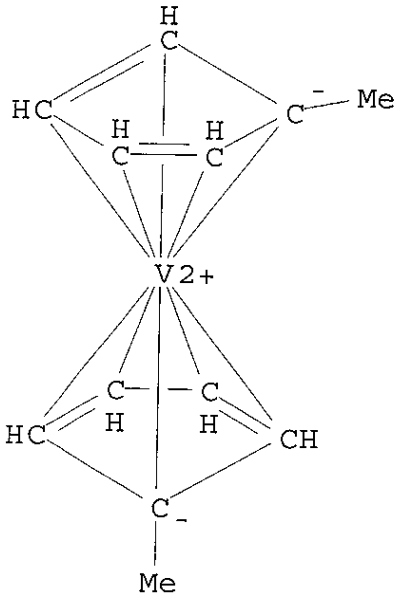
RN 11105-70-7 HCA
CN Niobium, bis(.eta.5-2,4-cyclopentadien-1-yl)(.eta.2-ethene)hydro- (9CI) (CA INDEX NAME)



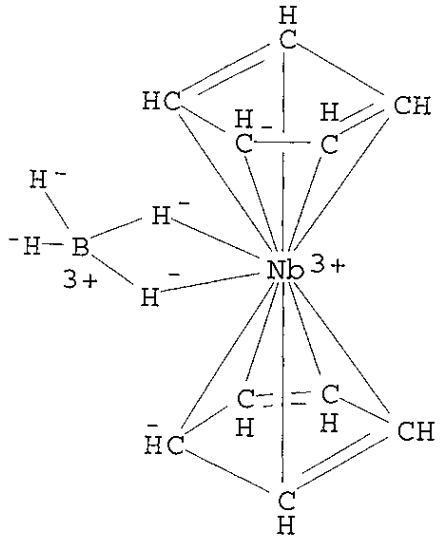
RN 12117-02-1 HCA
CN Tantalum, bis(.eta.5-2,4-cyclopentadien-1-yl)trihydro- (9CI) (CA INDEX NAME)



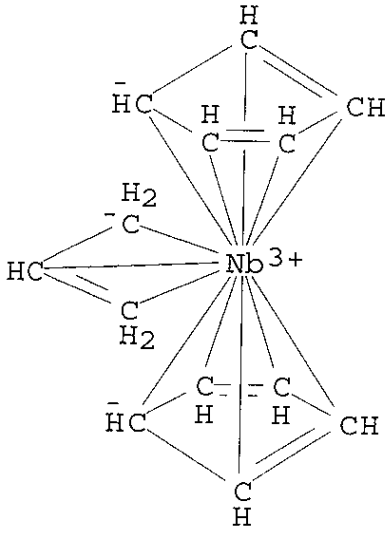
RN 12146-93-9 HCA
CN Vanadocene, 1,1'-dimethyl- (9CI) (CA INDEX NAME)



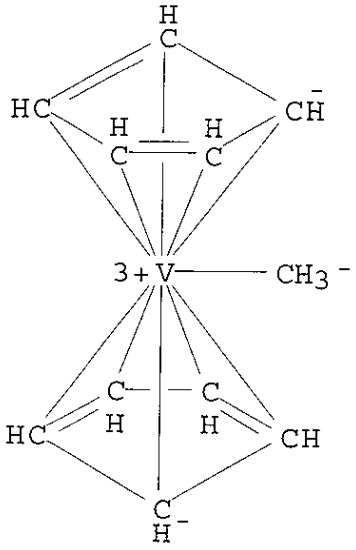
RN 37298-41-2 HCA
CN Niobium, bis(.eta.5-2,4-cyclopentadien-1-yl)[tetrahydroborato(1-)-.kappa.H,.kappa.H']- (9CI) (CA INDEX NAME)



RN 39413-65-5 HCA
CN Niobium, bis(.eta.5-2,4-cyclopentadien-1-yl)(.eta.3-2-propenyl)-(9CI) (CA INDEX NAME)



RN 54111-39-6 HCA
CN Vanadium, bis(.eta.5-2,4-cyclopentadien-1-yl)methyl- (9CI) (CA INDEX NAME)



IC ICM B05D003-06
ICS B05D005-12; C23C016-00
NCL 427252000
CC 56-6 (Nonferrous Metals and Alloys)
Section cross-reference(s): 29, 52, 76
ST **chem vapor deposition** organometallic compd; silicon metal **chem vapor deposition**; tungsten metal **chem vapor deposition**; cobalt vapor deposition organometallic compd; rhodium vapor deposition organometallic compd; iridium vapor deposition organometallic compd; nickel vapor deposition organometallic compd; palladium vapor deposition organometallic compd; platinum vapor deposition organometallic compd; copper vapor deposition organometallic compd; silver vapor deposition organometallic compd; gold vapor deposition organometallic compd
IT **Vapor deposition** processes
(**chem.**, of metals, on silicon and tungsten, organometallic compds. in low-temp.)
IT 7440-21-3, Silicon, miscellaneous 7440-33-7, Tungsten, miscellaneous
(**coating** of, with **metals**, by **chem. vapor deposition** at low temps. from organometallic compds.)
IT 7439-88-5, Iridium, uses 7440-02-0, Nickel, uses 7440-05-3, Palladium, uses 7440-06-4, Platinum, uses 7440-16-6, Rhodium, uses 7440-22-4, Silver, uses 7440-48-4, Cobalt, uses 7440-50-8, Copper, uses 7440-57-5, Gold, uses
(coating with, on silicon or tungsten, by **chem. vapor deposition** at low temps. from organometallic compds.)
IT 102-54-5, Ferrocene 1271-03-0 1271-24-5, Chromocene 1271-32-5

1271-33-6 1271-43-8 1271-44-9 1271-66-5 1277-43-6,
Cobaltocene 1291-40-3 1291-47-0 **11105-67-2**
11105-70-7 12082-46-1 12093-81-1 **12117-02-1**
12146-91-7 **12146-93-9** 12240-87-8 12306-95-5
12307-58-3 12307-59-4 12337-22-3 12772-20-2 32613-71-1
32825-27-7 32876-13-4 33270-46-1 33292-37-4 35770-29-7
35770-30-0 **37298-41-2** 37343-05-8 38386-55-9
38959-24-9 39015-37-7 **39413-65-5** 39529-31-2
40672-07-9 41348-25-8 41371-58-8 51733-16-5 51733-17-6
52308-70-0 53378-72-6 **54111-39-6** 56090-02-9
78618-85-6 80703-14-6 80848-36-8 95514-97-9 125819-64-9
147105-60-0 147105-61-1
(for **chem. vapor deposition** at low temps., on silicon or tungsten)

IT 1271-07-4P 1277-43-6P, Cobaltocene 1293-95-4P 12078-25-0P
12082-48-3P 12108-64-4P 12146-91-7P 16457-30-0P 38959-22-7P
94442-22-5P 147422-53-5P
(prepn. and use of, in **chem. vapor deposition** at low temps.)

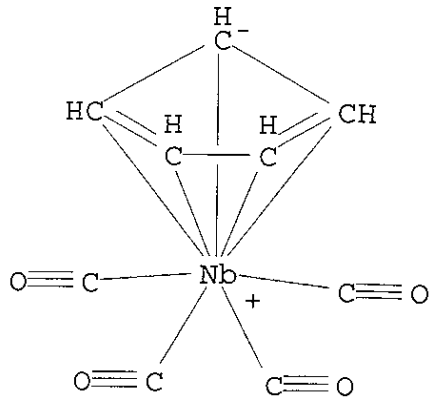
L28 ANSWER 14 OF 16 HCA COPYRIGHT 2003 ACS on STN
115:219214 Thin **films** of **niobium** and niobium oxides by **PECVD**. Deutschmann, L.; Suhr, H.; Herrmann, W. A.; Haerter, P. (Dep. Org. Chem., Univ. Tuebingen, Tuebingen, Germany). European Journal of Solid State and Inorganic Chemistry, 28(5), 1161-71 (English) 1991. CODEN: EJSCE5. ISSN: 0992-4361.

AB NbOx films (0 .ltoreq. x .ltoreq. 2.5) were prepd. by the **PECVD** method using n5-cyclopentadienyl)tetracarbonylniobium and (n-5-methylcyclopentadienyl)tetracarbonylniobium as volatile, easily available precursors. The influence of power, substrate temp., and gas compn. on deposition rates and film compn. was studied. Films prepd. under reductive conditions had metal contents approaching 100%. Highly pure films of Nb2O5 were synthesized when O2 was used as reactive gas.

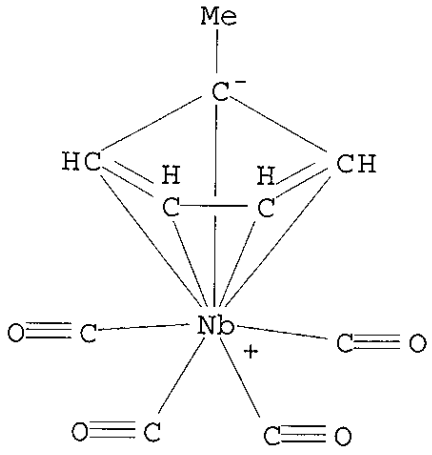
IT **12108-03-1 32984-99-9**
(decompn. of, in niobium and **niobium** oxide **film** deposition)

RN 12108-03-1 HCA

CN Niobium, tetracarbonyl(.eta.5-2,4-cyclopentadien-1-yl)- (9CI) (CA INDEX NAME)



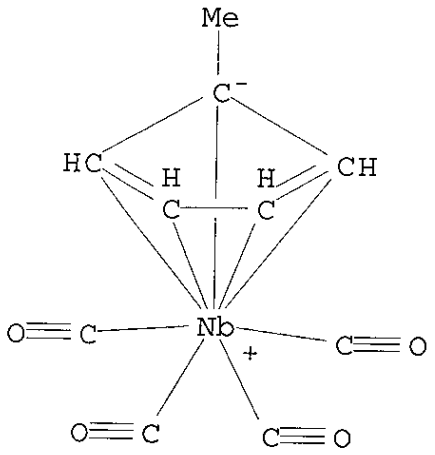
RN 32984-99-9 HCA
CN Niobium, tetracarbonyl[(1,2,3,4,5-.eta.)-1-methyl-2,4-cyclopentadien-1-yl]- (9CI) (CA INDEX NAME)



CC 75-1 (Crystallography and Liquid Crystals)
Section cross-reference(s): 29, 78
ST deposition **niobium** oxide **film** organometallic decompn
IT **12108-03-1 32984-99-9**
(decompn. of, in niobium and **niobium** oxide **film** deposition)

L28 ANSWER 15 OF 16 HCA COPYRIGHT 2003 ACS on STN
114:72718 Preparation of niobium and/or **niobium** oxide **films**. Haerter, Peter; Herrmann, Wolfgang; Deutschmann, Lutz; Suhr, Harald (SKW Trostberg A.-G., Germany). Ger. Offen. DE 3905417 A1 19900823, 4 pp. (German). CODEN: GWXXBX. APPLICATION: DE 1989-3905417 19890222.
AB The films are prepd. by decompn. of a Nb organometallic compd. in a glow discharge.

IT **32984-99-9**
(decompn. of, in glow discharge, in deposition of niobium and/or **niobium** oxide **film**)
RN 32984-99-9 HCA
CN Niobium, tetracarbonyl[(1,2,3,4,5-.eta.)-1-methyl-2,4-cyclopentadien-1-yl]- (9CI) (CA INDEX NAME)



IC ICM C23C016-18
ICS C23C016-50; C23C014-34; C03C017-09; C03C017-23; C30B025-02; C23C016-40
ICA C23F015-00; H01B012-00; B01J023-20; C07F009-00
CC 75-2 (Crystallography and Liquid Crystals)
Section cross-reference(s): 76
ST **niobium film** organometallic **chem vapor deposition**; oxide niobium organometallic **chem vapor deposition**; glow discharge decompn niobium organometallic compd
IT **32984-99-9**
(decompn. of, in glow discharge, in deposition of niobium and/or **niobium** oxide **film**)
IT 1313-96-8, Niobium oxide 7440-03-1, Niobium, uses and miscellaneous
(organometallic **chem. vapor deposition** of, in glow discharge)

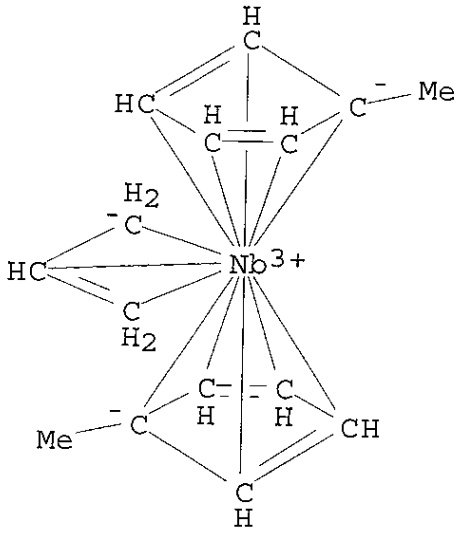
L28 ANSWER 16 OF 16 HCA COPYRIGHT 2003 ACS on STN
113:176793 **Chemical vapor deposition** of niobium carbide using a novel organometallic precursor. Stupik, Paul D.; Cheatham, Linda K.; Graham, John J.; Barron, Andrew R. (Dep. Chem., Harvard Univ., Cambridge, MA, 02138, USA). Materials Research Society Symposium Proceedings, 168(Chem. Vap. Deposition Refract. Met. Ceram.), 363-7 (English) 1990. CODEN: MRSPDH. ISSN: 0272-9172.
AB **Chem.-vapor deposition** from allyl[bis(methylcyclopentadienyl)]niobium(III) at atm. pressure yields **Nb** carbide **films** at temps. as low as

300.degree.. XPS studies indicate that the bulk films contain a carbide phase and a nearly stoichiometric ratio of Nb to C. The morphol. of the films was examd. using SEM.

IT **77847-31-5**
(decompn. of, for **niobium** carbide **films**)

RN 77847-31-5 HCA

CN Niobium, bis[(1,2,3,4,5-.eta.)-1-methyl-2,4-cyclopentadien-1-yl](.eta.3-2-propenyl)- (9CI) (CA INDEX NAME)



CC 57-2 (Ceramics)

ST niobium carbide **chem vapor deposition**; organometallic precursor niobium carbide

IT Coating process
(chem.-vapor, with **niobium** carbide **films**)

IT **77847-31-5**
(decompn. of, for **niobium** carbide **films**)

IT 12069-94-2P, **Niobium** carbide
(**films**, prepn. of, by low-temp. **chem.-vapor deposition**, organometallic precursor for)

=> d l29 1-16 cbib abs hitstr hitind

L29 ANSWER 1 OF 16 HCA COPYRIGHT 2003 ACS on STN

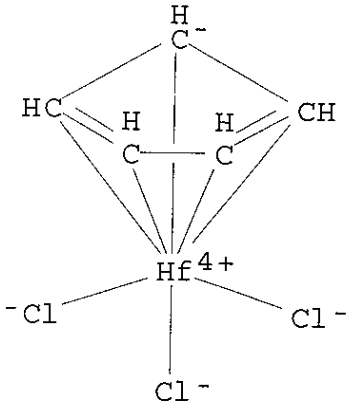
136:295124 Immobilization of metal chloride complexes of titanium, zirconium, and hafnium on a cyclopentadienyl surface of silica for ethylene polymerization. Uusitalo, Anne-Marja; Pakkanen, Tuula T.; Iskola, Eero I. (Department of Chemistry, University of Joensuu, Joensuu, FIN-80101, Finland). Journal of Molecular Catalysis A: Chemical, 177(2), 179-194 (English) 2002. CODEN: JMCCF2. ISSN: 1381-1169. Publisher: Elsevier Science B.V..

AB Metal chloride complexes, MCl4(THF)2 (M = Zr, Hf) and (Cp")MCl3 (M = Ti, Zr, Hf, Cp" = .eta.5-C5H5, or .eta.5-C5(CH3)5), were immobilized

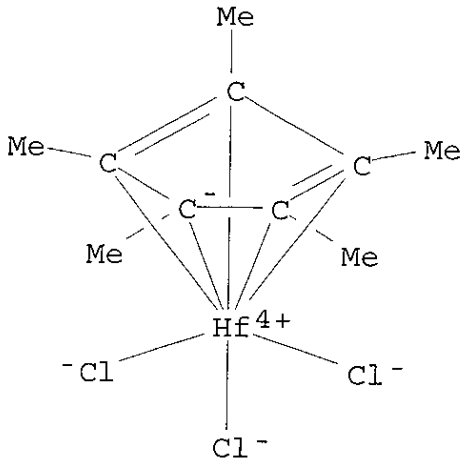
on a cyclopentadienyl surface of silica with a help of n-BuLi. Before this, the silica was modified with silane coupling agent, (EtO)3Si(CH2)3Cp, by applying satg. gas-solid reactions using at. layer **chem. vapor deposition** (ALCVD) technique. The heterogeneous catalysts were characterized by FTIR, 13C and 29Si solid state NMR spectroscopies and elemental analyses. The prepd. catalysts were tested in the polymn. of ethylene using methylaluminoxane (MAO) cocatalyst. Heterogeneous catalysts CpZrCl3/S and CpHfCl3/S (S = (EtO)3Si(CH2)3Cp modified silica carrier) exhibited high activities and produced polyethylene with a narrow molar mass distribution. However, the corresponding titanium catalyst, CpTiCl3/S, exhibited low activity in ethylene polymn. and it dimerized and oligomerized ethylene. The activities of heterogeneous MCl4(THF)2/S (M = Zr, Hf) and [.eta.5-C5(CH3)5]MCl3/S (M = Ti, Zr, Hf) catalysts were low and they all, except HfCl4(THF)2/S catalyst, produced polyethylene with a broad molar mass distribution. Catalyst leaching from the carrier was studied by treating the heterogeneous CpZrCl3/S catalyst with MAO.

IT **61906-04-5**, Cyclopentadienylhafnium trichloride
75181-08-7, Pentamethylcyclopentadienylhafnium trichloride
(immobilization of metal chloride complexes of titanium, zirconium, and hafnium on cyclopentadienyl surface of silica for ethylene polymn.)

RN 61906-04-5 HCA
CN Hafnium, trichloro(.eta.5-2,4-cyclopentadien-1-yl)- (9CI) (CA INDEX NAME)



RN 75181-08-7 HCA
CN Hafnium, trichloro[(1,2,3,4,5-.eta.)-1,2,3,4,5-pentamethyl-2,4-cyclopentadien-1-yl]- (9CI) (CA INDEX NAME)



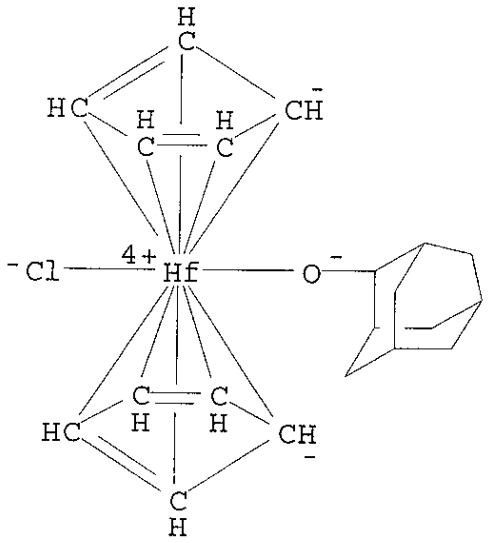
CC 35-3 (Chemistry of Synthetic High Polymers)
Section cross-reference(s): 67, 78
ST titanium zirconium hafnium metallocene silica catalyst ethylene polymn; chem tethering atom layer **chem vapor deposition** polymn catalyst
IT **Vapor deposition** process
(**chem.**; immobilization of metal chloride complexes of titanium, zirconium, and hafnium on cyclopentadienyl surface of silica for ethylene polymn.)
IT 1270-98-0, Cyclopentadienyltitanium trichloride 12129-06-5, Pentamethylcyclopentadienyltitanium trichloride 21959-01-3, Bis(tetrahydrofuran)zirconium tetrachloride 21959-05-7, Hafnium, tetrachlorobis(tetrahydrofuran)- 34767-44-7, Cyclopentadienylzirconium trichloride **61906-04-5**, Cyclopentadienylhafnium trichloride 75181-07-6, Pentamethylcyclopentadienylzirconium trichloride **75181-08-7**, Pentamethylcyclopentadienylhafnium trichloride
(immobilization of metal chloride complexes of titanium, zirconium, and hafnium on cyclopentadienyl surface of silica for ethylene polymn.)

L29 ANSWER 2 OF 16 HCA COPYRIGHT 2003 ACS on STN
134:86343 Fragmentation study of mixed-ligand zirconocene and hafnocene alcoholates of the type Cp2M(OR)Cl. Grafov, A. V.; Volkov, S. V.; Grafova, I. A.; Battiston, G. A.; Koval, L. I.; Traldi, P. (V.I. Vernadskii Institute of General and Inorganic Chemistry, National Academy of Sciences of Ukraine, Kiev, UA-252680/142, Ukraine). Rapid Communications in Mass Spectrometry, 14(21), 1979-1984 (English) 2000. CODEN: RCMSEF. ISSN: 0951-4198. Publisher: John Wiley & Sons Ltd..
AB The electron ionization mass spectrometric behavior of hafnocene and zirconocene chloroalcoholates is discussed. These data are also compared with those of mass-analyzed ion kinetic energy spectrometry. With respect to dialcoholato complexes previously

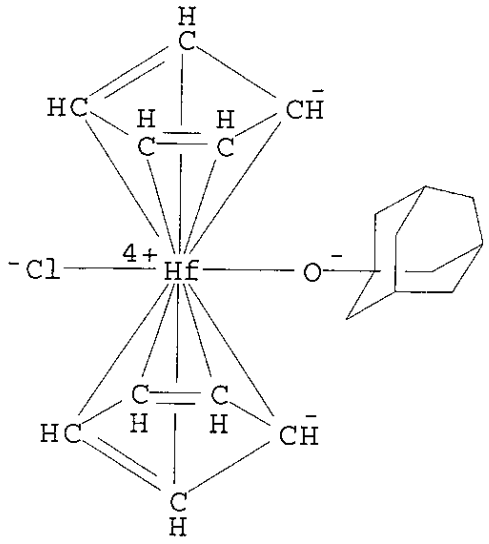
studied by the authors, the monochloro-alcoholato species show rather high intensities in their mol. ion peaks, which reflects their higher volatility and sufficient stability in the vapor phase. Fragmentation patterns of the complexes in question give relevant information on their gas-phase behavior and also on the influence of the ligand structure on the decompn. pathways. The complexes in question appear to be promising precursors for metal-org. **CVD (MOCVD)**.

IT **317331-79-6 317331-80-9 317331-81-0 317331-84-3**
(electron ionization mass spectrometric fragmentation study of)

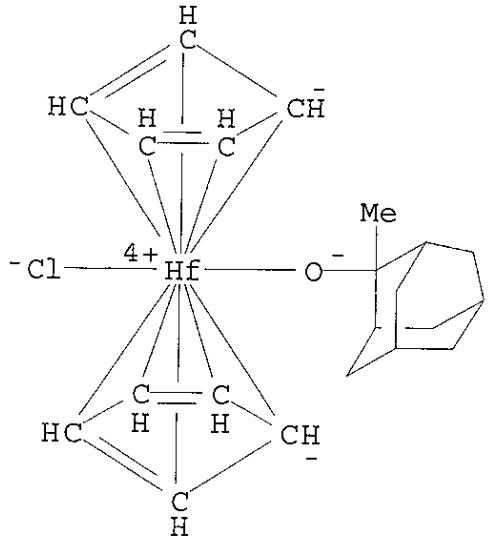
RN 317331-79-6 HCA
CN Hafnium, chlorobis(.eta.5-2,4-cyclopentadien-1-yl)(tricyclo[3.3.1.13,7]decan-2-olato)- (9CI) (CA INDEX NAME)



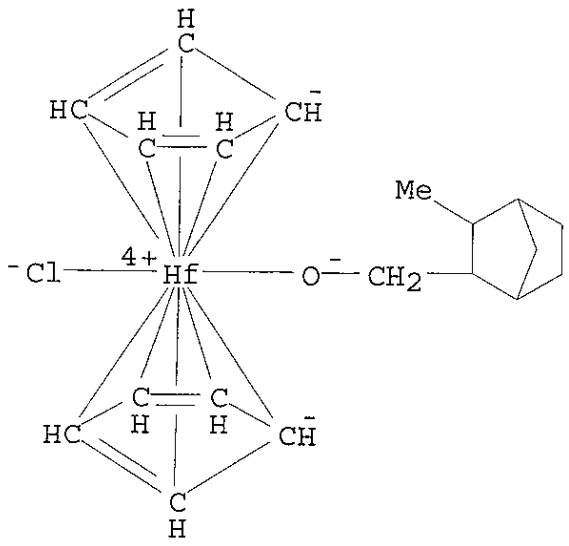
RN 317331-80-9 HCA
CN Hafnium, chlorobis(.eta.5-2,4-cyclopentadien-1-yl)(tricyclo[3.3.1.13,7]decan-1-olato)- (9CI) (CA INDEX NAME)



RN 317331-81-0 HCA
CN Hafnium, chlorobis(.eta.5-2,4-cyclopentadien-1-yl)(2-methyltricyclo[3.3.1.13,7]decan-2-olato)- (9CI) (CA INDEX NAME)



RN 317331-84-3 HCA
CN Hafnium, chlorobis(.eta.5-2,4-cyclopentadien-1-yl)(3-methylbicyclo[2.2.1]heptane-2-methanolato)- (9CI) (CA INDEX NAME)



CC 29-10 (Organometallic and Organometalloidal Compounds)
Section cross-reference(s): 22

IT **317331-79-6 317331-80-9 317331-81-0**
317331-83-2 **317331-84-3**
(electron ionization mass spectrometric fragmentation study of)

L29 ANSWER 3 OF 16 HCA COPYRIGHT 2003 ACS on STN

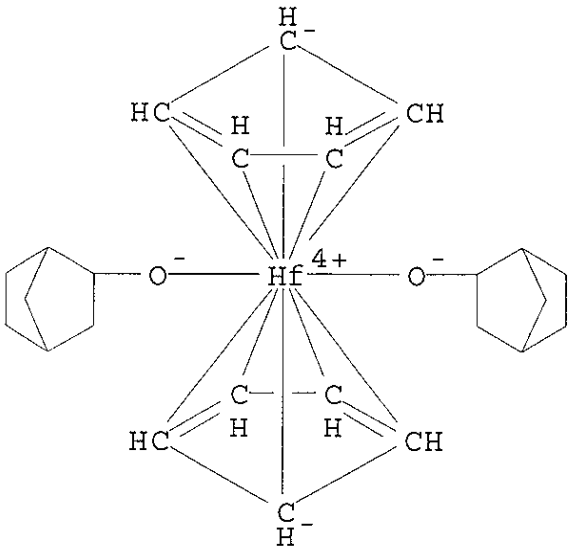
134:42223 Gas-phase fragmentation of zircono- and hafnocene complexes containing cage ligands. Grafov, A. V. (Inst. Zagal'noi ta Neorg. Khim. im. V. I. Vernadskogo, NAN Ukraini, Kiev, Ukraine). Ukrainskii Khimicheskii Zhurnal (Russian Edition), 66(5-6), 76-83 (Ukrainian) 2000. CODEN: UKZHAU. ISSN: 0041-6045. Publisher: Institut Obshchei i Neorganicheskoi Khimii im. V. I. Vernadskogo NAN Ukrainy.

AB The paper presents the results of mass-spectrometric studies of gas-phase behavior of a new family of mixed-ligand bis-cyclopentadienyl coordination compds. of Zr(IV) and Hf(IV) with alcoholate cage ligands contg. hydrocarbon frameworks. Fragmentation pathways of the principal ions were studied by MIKE spectroscopy that gives a correct correlation with thermal destruction pattern for the compd. in question. The structure of the ligand's hydrocarbon framework is the dominant factor that dets. both pathways and products of fragmentation. The influence of the central atom is considerably less significant. The author shows that it is possible to control a **CVD** process for obtaining a functionalized material possessing the desired structure and compn. by a deliberate synthesis of the precursor with necessary cage-framework ligands, and not only by phys. means of control.

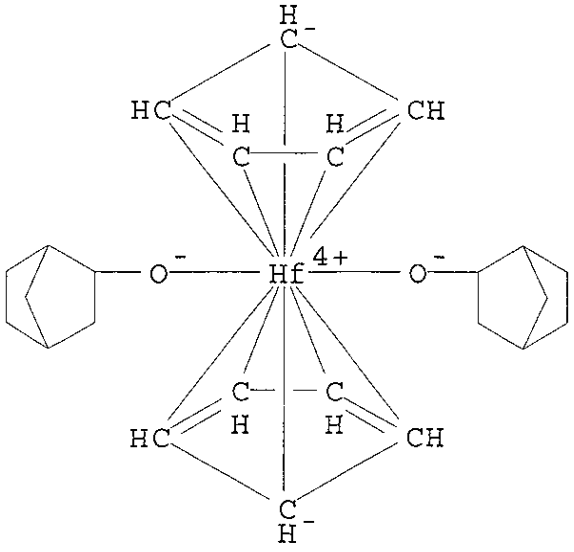
IT **148448-29-7 148554-44-3 168842-48-6**
168842-49-7 168842-50-0 185450-68-4
215590-26-4 215590-29-7 220872-30-0
220906-50-3 220906-51-4

(mass-spectral study of gas-phase fragmentation of zirconocene and hafnocene complexes contg. cage ligands)

RN 148448-29-7 HCA
CN Hafnium, bis[(1S,2R,4R)-bicyclo[2.2.1]heptan-2-olato]bis(.eta.5-2,4-cyclopentadien-1-yl)- (9CI) (CA INDEX NAME)

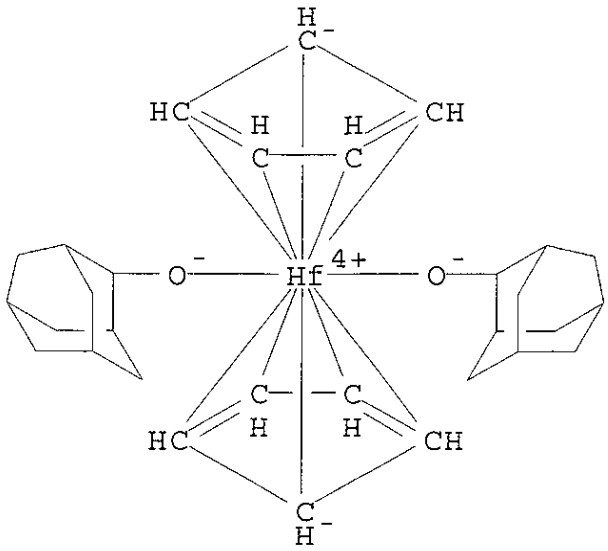


RN 148554-44-3 HCA
CN Hafnium, bis[(1R,2R,4S)-bicyclo[2.2.1]heptan-2-olato]bis(.eta.5-2,4-cyclopentadien-1-yl)- (9CI) (CA INDEX NAME)

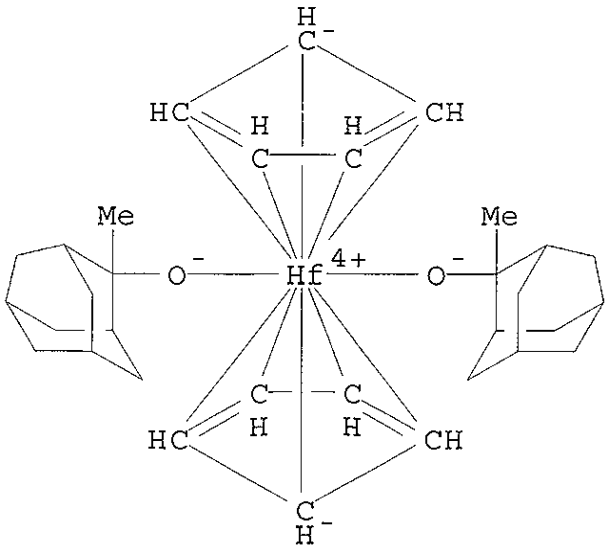


RN 168842-48-6 HCA
CN Hafnium, bis(.eta.5-2,4-cyclopentadien-1-

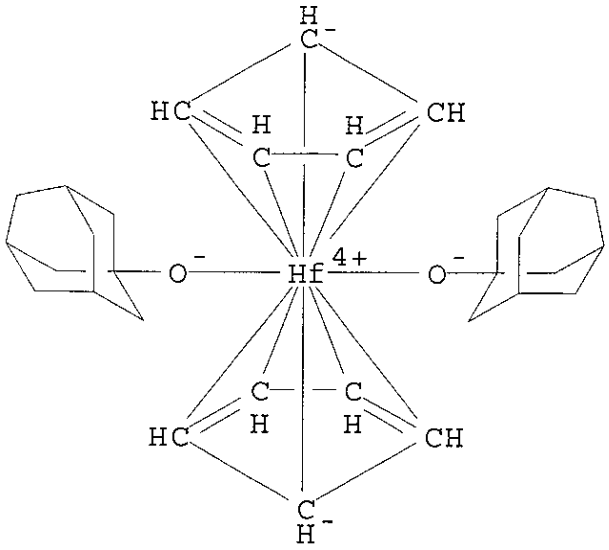
yl)bis(tricyclo[3.3.1.13,7]decan-2-olato)- (9CI) (CA INDEX NAME)



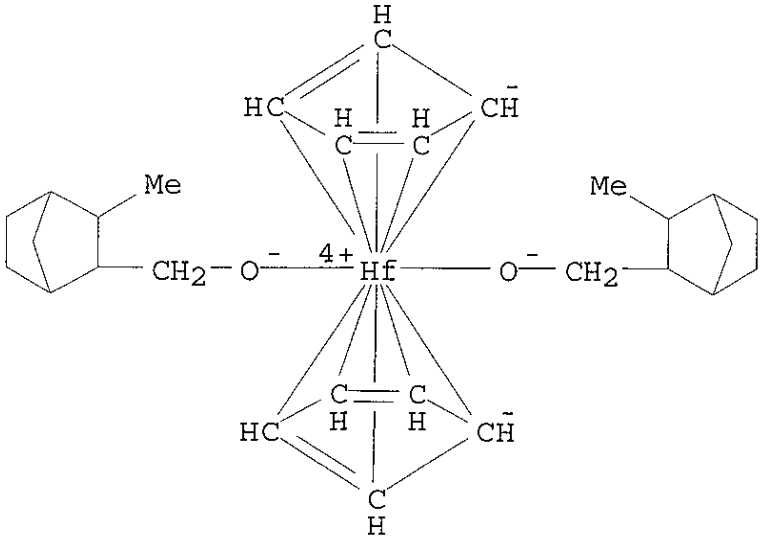
RN 168842-49-7 HCA
CN Hafnium, bis(.eta.5-2,4-cyclopentadien-1-yl)bis(2-methyltricyclo[3.3.1.13,7]decan-2-olato)- (9CI) (CA INDEX NAME)



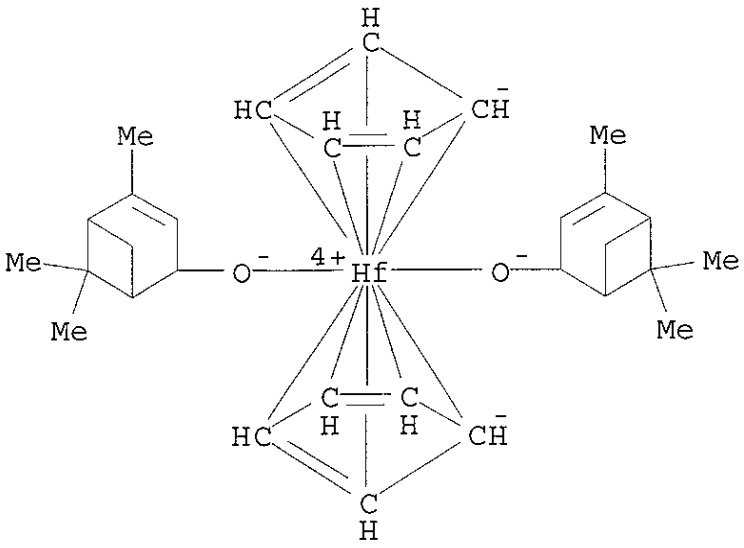
RN 168842-50-0 HCA
CN Hafnium, bis(.eta.5-2,4-cyclopentadien-1-yl)bis(tricyclo[3.3.1.13,7]decan-1-olato)- (9CI) (CA INDEX NAME)



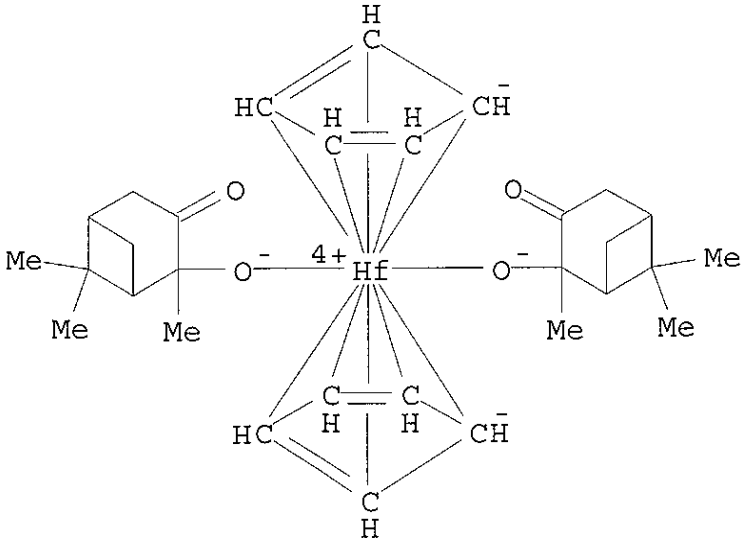
RN 185450-68-4 HCA
CN Hafnium, bis(.eta.5-2,4-cyclopentadien-1-yl)bis[(1S,2S,3R)-3-methylbicyclo[2.2.1]heptane-2-methanolato]- (9CI) (CA INDEX NAME)



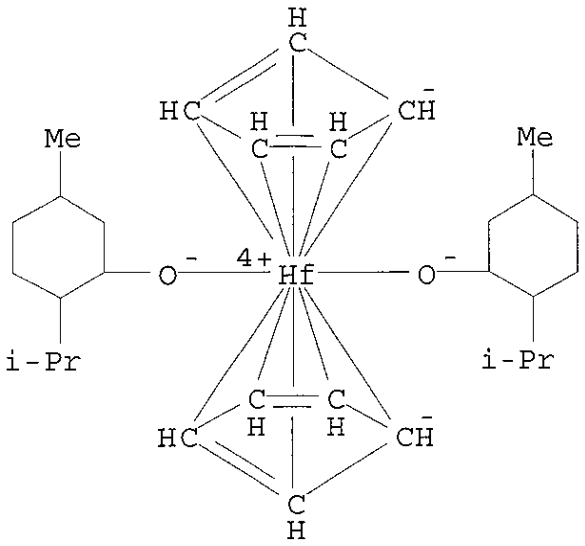
RN 215590-26-4 HCA
CN Hafnium, bis(.eta.5-2,4-cyclopentadien-1-yl)bis[(1S,2S,5S)-4,6,6-trimethylbicyclo[3.1.1]hept-3-en-2-olato]- (9CI) (CA INDEX NAME)



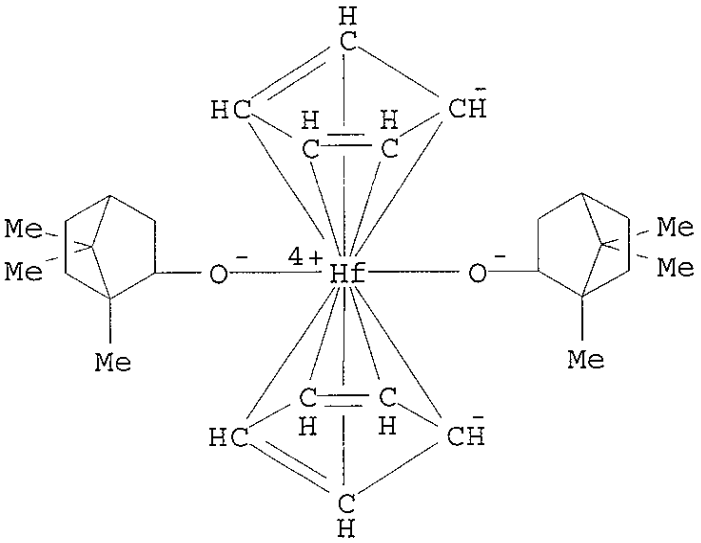
RN 215590-29-7 HCA
CN Hafnium, bis(.eta.5-2,4-cyclopentadien-1-yl)bis[(1S,2S,5S)-2-(hydroxy-.kappa.O)-2,6,6-trimethylbicyclo[3.1.1]heptan-3-onato]-(9CI) (CA INDEX NAME)



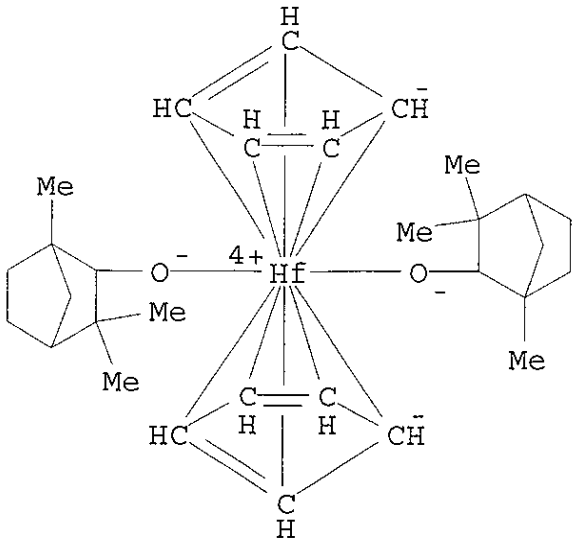
RN 220872-30-0 HCA
CN Hafnium, bis(.eta.5-2,4-cyclopentadien-1-yl)bis[(1R,2S,5R)-5-methyl-2-(1-methylethyl)cyclohexanolato]- (9CI) (CA INDEX NAME)



RN 220906-50-3 HCA
CN Hafnium, bis(.eta.5-2,4-cyclopentadien-1-yl)bis[(1S,2R,4S)-1,7,7-trimethylbicyclo[2.2.1]heptan-2-olato]- (9CI) (CA INDEX NAME)



RN 220906-51-4 HCA
CN Hafnium, bis(.eta.5-2,4-cyclopentadien-1-yl)bis[(1R,2R,4S)-1,3,3-trimethylbicyclo[2.2.1]heptan-2-olato]- (9CI) (CA INDEX NAME)



CC 29-10 (Organometallic and Organometalloidal Compounds)
Section cross-reference(s): 22, 73

IT **Vapor deposition** process
(**chem.**; of zirconocene and hafnocene complexes contg. cage ligands)

IT **148448-29-7 148554-44-3** 168842-45-3
168842-46-4 168842-47-5 **168842-48-6 168842-49-7**
168842-50-0 185450-66-2 **185450-68-4**
215590-23-1 **215590-26-4 215590-29-7**
220872-30-0 220872-31-1 220872-34-4 220872-36-6
220906-43-4 220906-48-9 **220906-50-3 220906-51-4**
250162-12-0
(mass-spectral study of gas-phase fragmentation of zirconocene and hafnocene complexes contg. cage ligands)

L29 ANSWER 4 OF 16 HCA COPYRIGHT 2003 ACS on STN
133:166144 Palladium and palladium alloy composite membranes prepared by metal-organic **chemical vapor deposition** method (cold-wall). Jun, C.-S.; Lee, K.-H. (Membrane & Separation Research Center, Korean Research Institute of Chemical Technology, Yusung, Taejon, 305-606, S. Korea). Journal of Membrane Science, 176(1), 121-130 (English) 2000. CODEN: JMESDO. ISSN: 0376-7388. Publisher: Elsevier Science B.V..

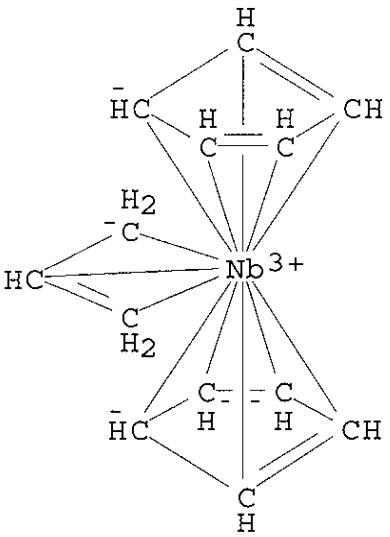
AB Thin Pd and Pd-Ni alloy membranes were prepd. by the **MOCVD** method using an cold-wall technique. Pd(C3H5)(C5H5) and Ni(C3H5)(C5H5) were decompd. into densely aggregated metal crystallites that were to plug mesoporous nickel-stainless steel (Ni-SUS) or .gamma.-Al2O3/.alpha.-Al2O3 supports. The use of highly volatile organometallic precursors enabled continuous and controlled deposition mode, which resulted in reproducible formation of thin impervious Pd or Pd-Ni alloy membranes. Pd(C3H5)(C5H5) and Nb(C3H5)(C5H5)2 were deposited in a layer by layer deposition

method. The H2 permeance of the Pd/Ni-SUS membrane was 2.0-5.0.times.10-2 cm3 cm-2 cmHg-1 s-1 (723 K); the H2/N2 selectivity was 1600. The H2 permeance of the Pd/Al2O3 was 1.5.times.10-2 cm3 cm-2 cmHg-1 s-1 (723 K); the H2/N2 selectivity was .degree.1000.

IT **39413-65-5**
(starting material; palladium and palladium alloy composite membranes prepd. by metal-org. **chem. vapor deposition** method (cold-wall))

RN 39413-65-5 HCA

CN Niobium, bis(.eta.5-2,4-cyclopentadien-1-yl)(.eta.3-2-propenyl)-(9CI) (CA INDEX NAME)



CC 52-1 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 56

ST palladium composite membrane hydrogen sepn **CVD**; alumina nickel stainless steel porous support

IT Membranes, nonbiological
Vapor deposition process
(palladium and palladium alloy composite membranes prepd. by metal-org. **chem. vapor deposition** method (cold-wall))

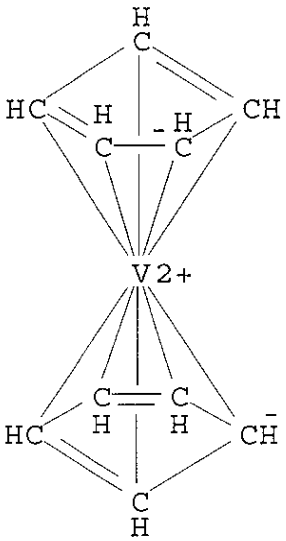
IT Ceramics
(support; palladium and palladium alloy composite membranes prepd. by metal-org. **chem. vapor deposition** method (cold-wall))

IT 7440-05-3, Palladium, uses
(palladium and palladium alloy composite membranes prepd. by metal-org. **chem. vapor deposition** method (cold-wall))

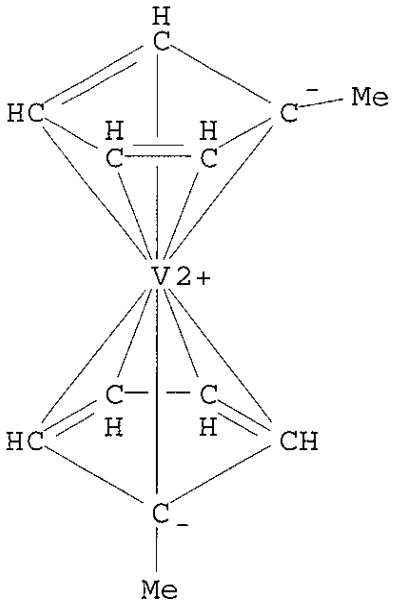
IT 1333-74-0, Hydrogen, uses
(sepn.; palladium and palladium alloy composite membranes prepd. by metal-org. **chem. vapor deposition**

method (cold-wall))
IT 1271-03-0 12107-46-9 **39413-65-5**
(starting material; palladium and palladium alloy composite membranes prepd. by metal-org. **chem. vapor deposition** method (cold-wall))
IT 1344-28-1, Alumina, uses 12597-68-1, Nickel stainless steel, uses
(support; palladium and palladium alloy composite membranes prepd. by metal-org. **chem. vapor deposition** method (cold-wall))

L29 ANSWER 5 OF 16 HCA COPYRIGHT 2003 ACS on STN
131:329972 Gettering material and manufacture of image formation apparatus. Arai, Yoshitaka (Canon K. K., Japan). Jpn. Kokai Tokkyo Koho JP 11312466 A2 19991109 Heisei, 15 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1998-118572 19980428.
AB The material is manufd. by decompn. of a metalorg. compd. in a vacuum container. The app. has an electron source, an image formation material, and the gettering material. The manuf. method involves forming the gettering material by the claimed method. The gettering material shows efficient adsorption, so that the app. which is appropriate for long-time use under vacuum can be manufd. The app. gives good images with high luminance.
IT **1277-47-0**, Biscyclopentadienyl vanadium **12146-93-9**
(manuf. of gettering material for image formation app.)
RN 1277-47-0 HCA
CN Vanadocene (9CI) (CA INDEX NAME)



RN 12146-93-9 HCA
CN Vanadocene, 1,1'-dimethyl- (9CI) (CA INDEX NAME)



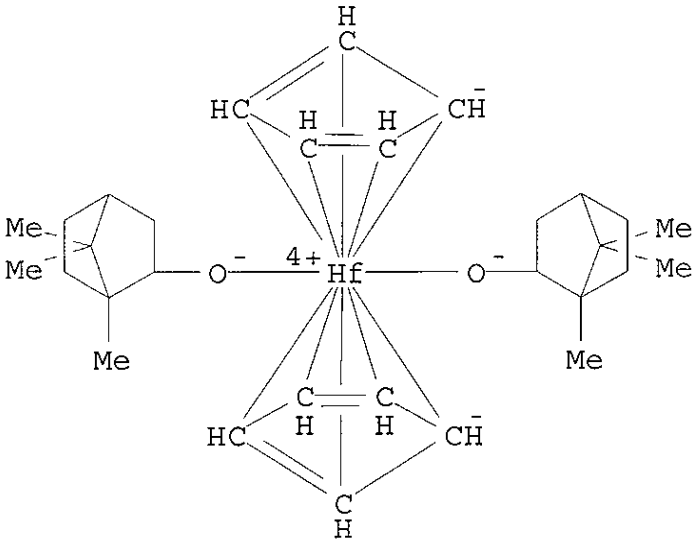
IC ICM H01J009-39
ICS H01J007-18; H01J029-94; H01J031-12
CC 74-13 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
Section cross-reference(s): 75
ST gettering material image formation app; metalorg **CVD** getter optical imaging app
IT 75-24-1, Trimethyl aluminum 97-93-8, Triethyl aluminum, processes 100-99-2, Triisobutyl aluminum, processes 102-54-5, Biscyclopentadienyl iron **1277-47-0**, Biscyclopentadienyl vanadium 1291-47-0 3275-24-9, Tetradimethylamino titanium 4419-47-0 7440-62-2, Vanadium, processes 12076-08-3 **12146-93-9** 13801-49-5 16842-00-5 19756-04-8
(manuf. of gettering material for image formation app.)

L29 ANSWER 6 OF 16 HCA COPYRIGHT 2003 ACS on STN
130:325225 Fragmentation study of zirconocene and hafnocene dialcoholates containing trimethylbicyclo[2.2.1]heptane moieties. Grafov, Andrei V.; Traldi, Pietro; Grafova, Irina A.; Battiston, Giovanni A. (National Academy of Sciences of Ukraine, V.I. Vernadskii Institute of General and Inorganic Chemistry, Kiev, UA-252680, Ukraine). Rapid Communications in Mass Spectrometry, 13(5), 297-301 (English) 1999. CODEN: RCMSEF. ISSN: 0951-4198. Publisher: John Wiley & Sons Ltd..
AB The electron ionization mass spectrometric behavior of hafnocene and zirconocene dialcoholates is discussed. Deprotonated moieties of borneol and fenchyl alc. were used as .sigma.-ligands. These data are also compared to those of mass-analyzed ion kinetic energy spectroscopy of the mol. ions. Fragmentation patterns of the complexes in question give relevant information on their gas-phase

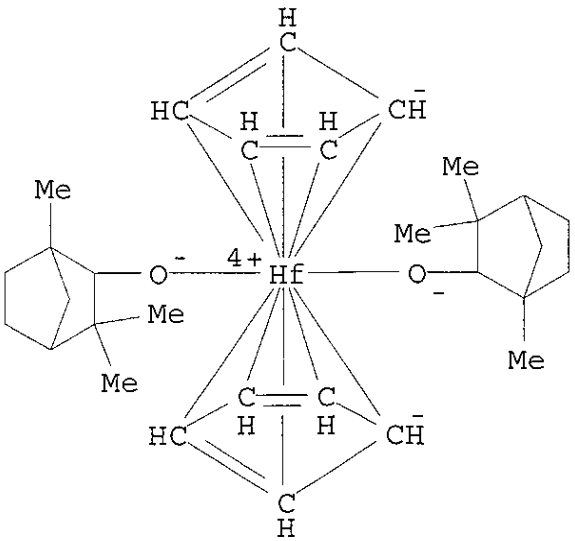
behavior and also on the influence of the ligand structure on the decompn. pathways. The complexes in question appear to be promising metal-org. chem. vapor decompn. precursors.

IT **220906-50-3 220906-51-4**
(fragmentation study of zirconocene and hafnocene dialcoholates contg. trimethylbicyclo[2.2.1]heptane moieties)

RN 220906-50-3 HCA
CN Hafnium, bis(.eta.5-2,4-cyclopentadien-1-yl)bis[(1S,2R,4S)-1,7,7-trimethylbicyclo[2.2.1]heptan-2-olato]- (9CI) (CA INDEX NAME)

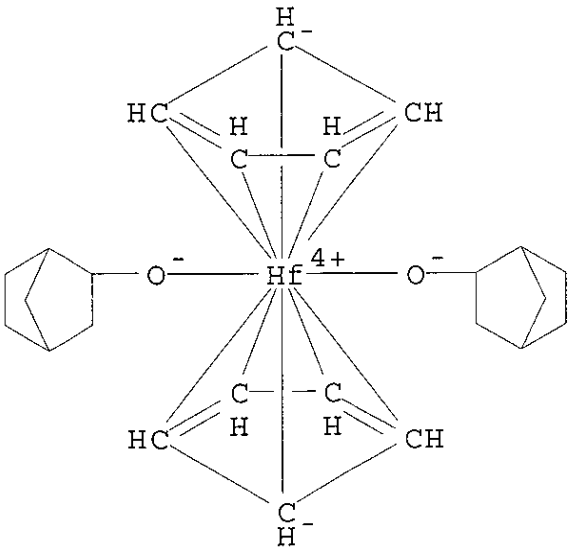


RN 220906-51-4 HCA
CN Hafnium, bis(.eta.5-2,4-cyclopentadien-1-yl)bis[(1R,2R,4S)-1,3,3-trimethylbicyclo[2.2.1]heptan-2-olato]- (9CI) (CA INDEX NAME)



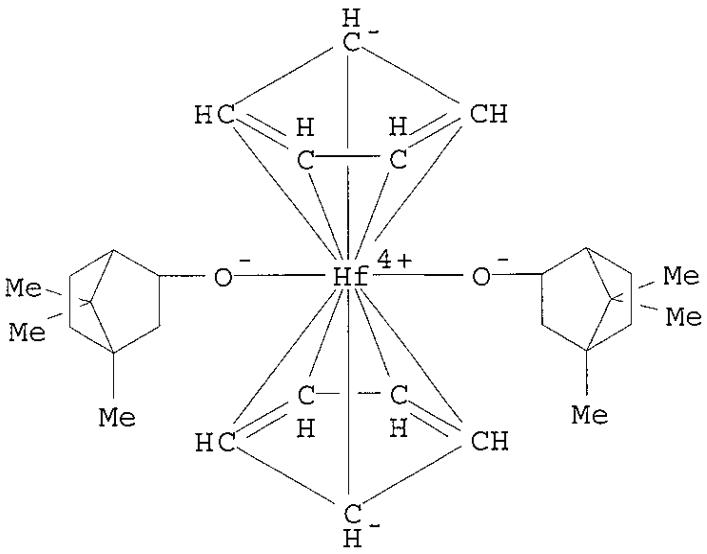
CC 29-10 (Organometallic and Organometalloidal Compounds)
Section cross-reference(s): 22, 30
ST mass spectra zirconocene hafnocene dialcoholate; **CVD** precursor zirconocene hafnocene dialcoholate; **MOCVD** precursor zirconocene hafnocene dialcoholate
IT 220872-34-4 220872-36-6 **220906-50-3 220906-51-4**
(fragmentation study of zirconocene and hafnocene dialcoholates contg. trimethylbicyclo[2.2.1]heptane moieties)

L29 ANSWER 7 OF 16 HCA COPYRIGHT 2003 ACS on STN
128:271733 Hard protective coatings from new bicyclo[2.2.1]heptanolates of dicyclopentadienyl hafnium. Volkov, S. V.; Grafov, A. V.; Battiston, G. A.; Koval, L. A.; Gerbasi, R.; Porchia, M.; Zanella, P.; Mazurenko, E. A. (V. I. Vernadskii Institute of General and Inorganic Chemistry, National Academy of Sciences of Ukraine, Kiev, UA-252680, Ukraine). Proceedings - Electrochemical Society, 97-25(Chemical Vapor Deposition), 455-462 (English) 1997. CODEN: PESODO. ISSN: 0161-6374. Publisher: Electrochemical Society.
AB Hard protective HfO2 coatings were prepd. by **MOCVD** of dicyclopentadienyl Hf derivs. of (+)-endo-norborneol, (+)-exo-norborneol, [(1S)-endo]-(-)-borneol, (1R)-endo-(+)-fenchyl alc., and (+)-3-methyl-2-norbornanemethanol.
IT **148448-29-7 148448-30-0 148554-44-3 185450-68-4 220906-51-4**
(prepn. of hard protective hafnia coatings by **MOCVD** of bicyclo[2.2.1]heptanolates of dicyclopentadienyl hafnium)
RN 148448-29-7 HCA
CN Hafnium, bis[(1S,2R,4R)-bicyclo[2.2.1]heptan-2-olato]bis(.eta.5-2,4-cyclopentadien-1-yl)- (9CI) (CA INDEX NAME)

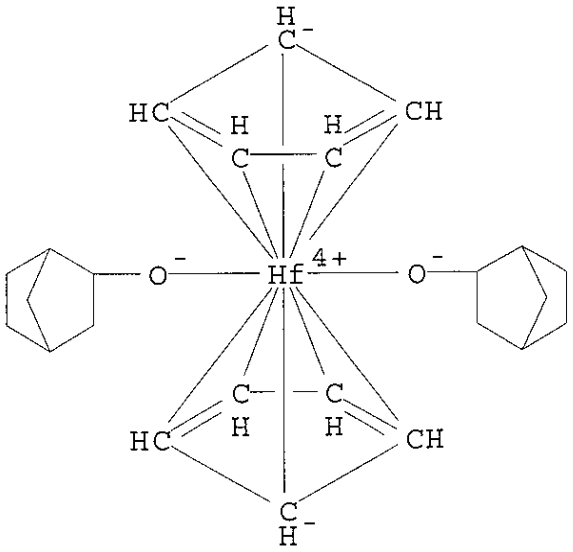


RN 148448-30-0 HCA
CN Hafnium, bis(.eta.5-2,4-cyclopentadien-1-yl)bis(1,7,7-

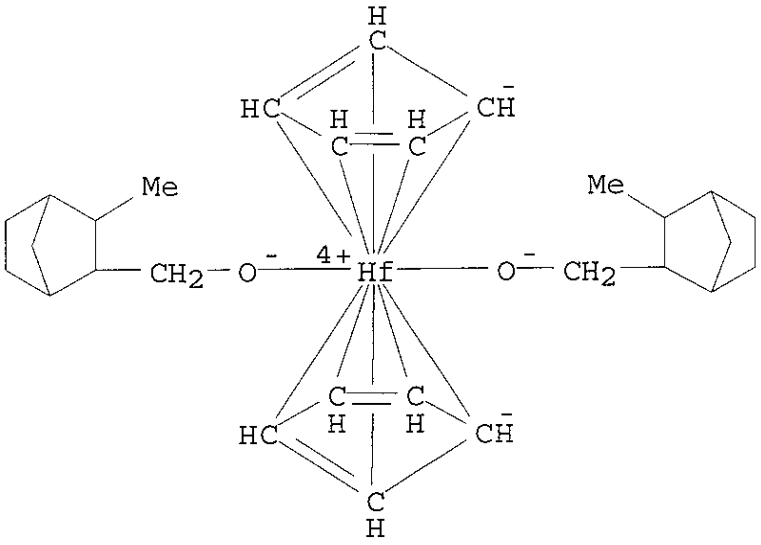
trimethylbicyclo[2.2.1]heptan-2-olato)-, [1S-[1.alpha.,2.beta.(1R*,2S*,4S*),4.alpha.]]- (9CI) (CA INDEX NAME)



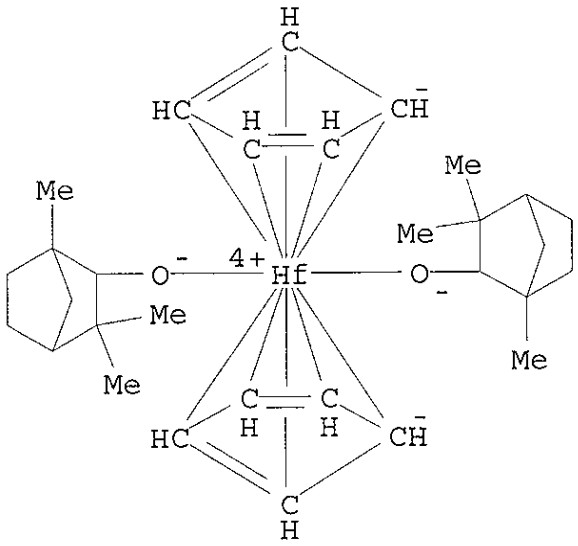
RN 148554-44-3 HCA
CN Hafnium, bis[(1R,2R,4S)-bicyclo[2.2.1]heptan-2-olato]bis(.eta.5-2,4-cyclopentadien-1-yl)- (9CI) (CA INDEX NAME)



RN 185450-68-4 HCA
CN Hafnium, bis(.eta.5-2,4-cyclopentadien-1-yl)bis[(1S,2S,3R)-3-methylbicyclo[2.2.1]heptane-2-methanolato]- (9CI) (CA INDEX NAME)



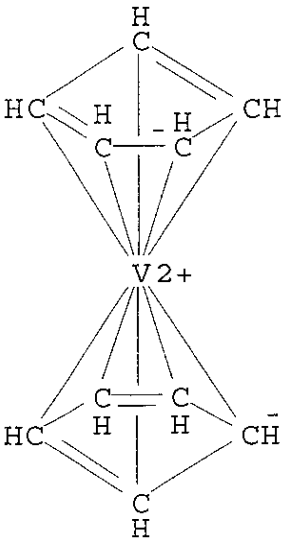
RN 220906-51-4 HCA
CN Hafnium, bis(.eta.5-2,4-cyclopentadien-1-yl)bis[(1R,2R,4S)-1,3,3-trimethylbicyclo[2.2.1]heptan-2-olato]- (9CI) (CA INDEX NAME)



CC 42-10 (Coatings, Inks, and Related Products)
Section cross-reference(s): 57
ST hafnia coating prepn **MOCVD** hafnocene deriv; norborneol hafnocene **MOCVD** hafnia coating; borneol hafnocene **MOCVD** hafnia coating; fenchyl alc hafnocene **MOCVD** hafnia coating; methylnorbornanemethanol hafnocene **MOCVD** hafnia coating
IT Coating materials
(prepn. of hard protective hafnia coatings by **MOCVD** of

bicyclo[2.2.1]heptanolates of dicyclopentadienyl hafnium)
IT **148448-29-7 148448-30-0 148554-44-3**
185450-68-4 220906-51-4
(prepn. of hard protective hafnia coatings by **MOCVD** of bicyclo[2.2.1]heptanolates of dicyclopentadienyl hafnium)
IT 12055-23-1, Hafnia
(prepn. of hard protective hafnia coatings by **MOCVD** of bicyclo[2.2.1]heptanolates of dicyclopentadienyl hafnium)

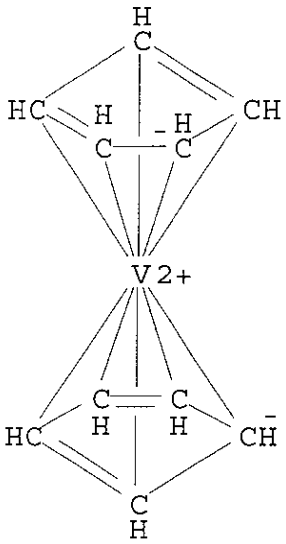
L29 ANSWER 8 OF 16 HCA COPYRIGHT 2003 ACS on STN
125:202718 Thermodynamic approach of the OM-**CVD** of vanadium carbide from vanadocene. Poirier, L.; Teyssandier, F. (GIAT Industries, Bourges, F-18023, Fr.). Proceedings - Electrochemical Society, 96-5(Chemical Vapor Deposition), 757-762 (English) 1996. CODEN: PESODO. ISSN: 0161-6374. Publisher: Electrochemical Society.
AB A thermodn. study was undertaken to det. the influence of the gas-phase compn. on the nature of the phases that are grown by the organometallic **CVD** (OM-**CVD**) process in the V-C-O-H system. The thermodn. simulation was carried out with vanadocene ((.pi.-C5H5)2V) as precursor. The isothermal sections of the ternary V-C-O phase diagram were first modeled at 500 and 700.degree.C. With the detd. data, the deposition diagrams were calcd. and the influence of various parameters such as the substrate temp., hydrogen diln. and amt. of oxygen contaminant were investigated and discussed in relation with the gas phase compn.
IT **1277-47-0**, Vanadocene
(precursor; thermodn. approach of organometallic **CVD** of vanadium carbide from vanadocene)
RN 1277-47-0 HCA
CN Vanadocene (9CI) (CA INDEX NAME)



CC 57-2 (Ceramics)

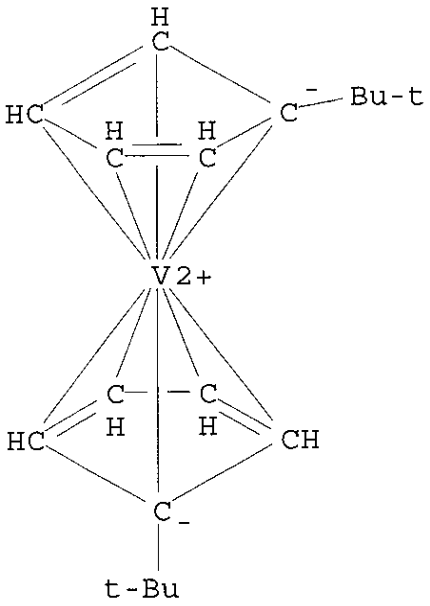
ST thermodn **CVD** vanadium carbide vanadocene precursor
IT Thermodynamics
Vapor deposition processes
(thermodn. approach of organometallic **CVD** of vanadium carbide from vanadocene)
IT **1277-47-0**, Vanadocene
(precursor; thermodn. approach of organometallic **CVD** of vanadium carbide from vanadocene)
IT 39455-49-7, Vanadium carbide oxide
(solid soln.; thermodn. approach of organometallic **CVD** of vanadium carbide from vanadocene)
IT 12070-10-9P, Vanadium carbide
(thermodn. approach of organometallic **CVD** of vanadium carbide from vanadocene)

L29 ANSWER 9 OF 16 HCA COPYRIGHT 2003 ACS on STN
125:142909 Thermal behavior of vanadocene. Poirier, L.; Teyssandier, F.; Danjoy, C.; Valade, L.; Sibieude, F.; Reynes, A.; Jauberteau, J. L. (GIAT Industries, 7 Route de Guerry, Bourges, F-18023, Fr.). Journal of Analytical and Applied Pyrolysis, 36(2), 121-136 (English) 1996. CODEN: JAAPDD. ISSN: 0165-2370. Publisher: Elsevier.
AB This paper reports a study of the thermal behavior of vanadocene (Cp2V) between 373 and 473 K by TG, DTA, x-ray diffraction, IR spectrometry and mass spectrometry. Below 400 K the predominant vaporization process is the sublimation of Cp2V. Above 403 K a solid state mechanism resulting from the breaking of the central bond of the organometallic compd. prevails. Vanadocene is proposed as a promising precursor for the **CVD** of V carbide. Previous **CVD** expts. have stressed the dependence between the vanadocene vaporization process and the properties of the deposited V carbide. The detailed results presented here identify the nature of the vaporized species as a function of the vanadocene temp., in the temp. range of interest for **CVD**. These results should provide greater insight and control of the **CVD** of V carbide from vanadocene.
IT **1277-47-0**, Vanadocene
(thermal behavior of)
RN 1277-47-0 HCA
CN Vanadocene (9CI) (CA INDEX NAME)



CC 29-10 (Organometallic and Organometalloidal Compounds)
IT **1277-47-0**, Vanadocene 12070-10-9, Vanadium carbide
(thermal behavior of)

L29 ANSWER 10 OF 16 HCA COPYRIGHT 2003 ACS on STN
124:146372 tert-Butyl-substituted vanadocene, (C5H4CMe3)2V: a precursor for **MOCVD** of pure vanadium carbide. Derraz, Younes; Cyr-Athis, Olivier; Choukroun, Robert; Valade, Lydie; Cassoux, Patrick; Dahan, Francoise; Teyssandier, Francis (laboratoire de Chimie de Coordination, CNRS, Toulouse, 31077, Fr.). Journal of Materials Chemistry, 5(11), 1775-8 (English) 1995. CODEN: JMACEP. ISSN: 0959-9428. Publisher: Royal Society of Chemistry.
AB (C6H4CMe3)2V (1), was used as a precursor in the **CVD** prepn. (740.degree. under H at atm. pressure on steel substrates) of cryst. VC0.88 thin films, characterized by XRD, SEM, XPS and electron probe microanal. with wavelength dispersive spectroscopy (EPMA-WDS), which are not contaminated by graphitic C or O. 1 Was obtained by reaction of (C5H4CMe3)Na with [(V2Cl3)(THF)6]2(Zn2Cl6) and characterized by x-ray crystal structure anal. [monoclinic, space group P21/n; a 6.164(1), b 11.263(2), c 11.842(2) .ANG., .beta. 96.31(2).degree.; Z = 2]. A possible mechanism for the deposition of VC films from 1 is proposed.
IT **54761-79-4P**
(prepn., crystal structure and precursor for **MOCVD** of pure vanadium carbide)
RN 54761-79-4 HCA
CN Vanadocene, 1,1'-bis(1,1-dimethylethyl)- (9CI) (CA INDEX NAME)



CC 29-10 (Organometallic and Organometalloidal Compounds)
Section cross-reference(s): 73, 75

ST crystal structure tertiary butylvanadocene; mol structure tertiary butylvanadocene; vanadocene tertiary butyl prepn crystal structure; **MOCVD** tertiary butylvanadocene; **chem vapor deposition** tertiary butylvanadocene; diffraction x ray vanadium carbide; SEM vanadium carbide; photoelectron spectroscopy x ray vanadium carbide

IT **54761-79-4P**
(prepn., crystal structure and precursor for **MOCVD** of pure vanadium carbide)

IT 12070-10-9P, Vanadium carbide
(tertiary butylvanadocene for **MOCVD** of pure)

L29 ANSWER 11 OF 16 HCA COPYRIGHT 2003 ACS on STN

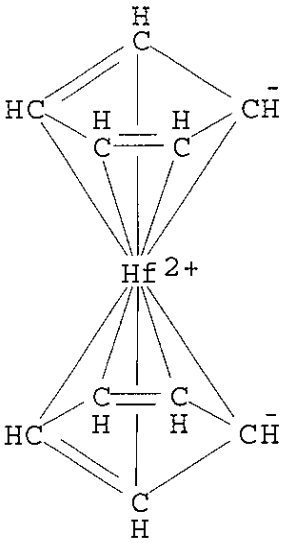
124:117486 Structure and destruction of a precursor: Mass-spectrometric evaluation of creation of functional films with predeterminated composition. Grafov, A.; Grafova, I. A.; Mazurenko, E.; Koval, L. I.; Catinella, S.; Traldi, P.; Battiston, G. A.; Zanella, P. (V.I. Vernadskii Institute General and Inorganic Chemistry, National Academy Sciences Ukraine, Kiev, UA-252142, Ukraine). Journal de Physique IV, 5(C5, Chemical Vapour Deposition, Vol. 1), C5-541-C5-546 (English) 1995. CODEN: JPICEI. ISSN: 1155-4339. Publisher: Editions de Physique.

AB Among a variety of applications of organometallic compds., their use as **MOCVD** precursors is one of the most extensive areas. To the authors' minds, one of the most powerful and accurate methods for evaluation and prediction of thermal behavior of the precursor is mass-spectrometry coupled with mass-analyzed ion kinetic energy spectrometry. Traditionally, both structure and compn. of deposited

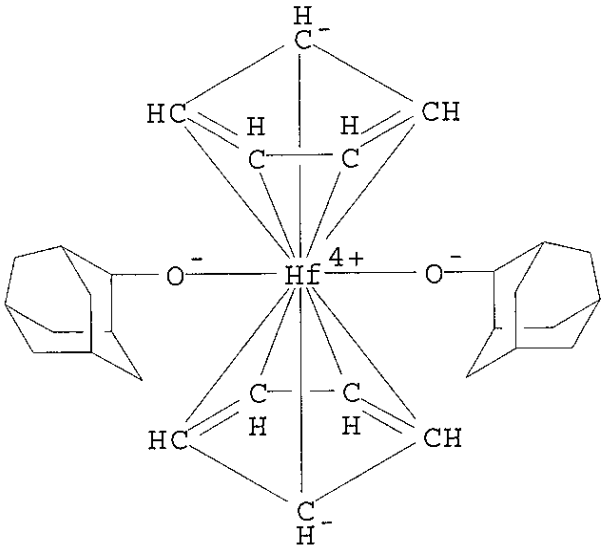
materials and the precursor's thermal decompn. channels were controlled by gas-phase compn., the process temp. and pressure, i.e. by external factors. A possibility of such a control via inner factors - i.e. structure of a specially designed precursors is demonstrated for new mixed-ligand organometallic compds. of In, Zr and Hf.

IT **53433-57-1D**, Hafnocene, dialcoholates **168842-48-6** **168842-49-7** **168842-50-0**
(**MOCVD** in relation to mass spectra of)

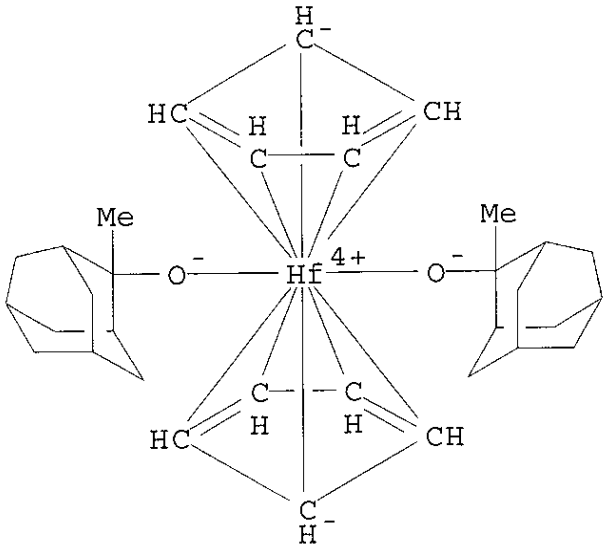
RN 53433-57-1 HCA
CN Hafnocene (9CI) (CA INDEX NAME)



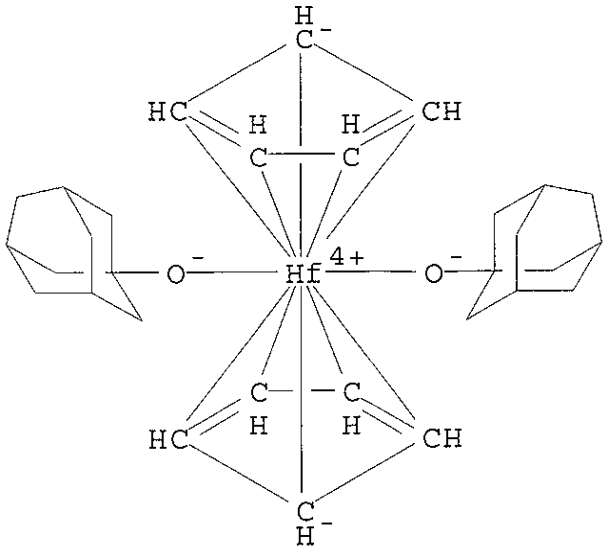
RN 168842-48-6 HCA
CN Hafnium, bis(.eta.5-2,4-cyclopentadien-1-yl)bis(tricyclo[3.3.1.13,7]decan-2-olato)- (9CI) (CA INDEX NAME)



RN 168842-49-7 HCA
CN Hafnium, bis(.eta.5-2,4-cyclopentadien-1-yl)bis(2-methyltricyclo[3.3.1.13,7]decan-2-olato)- (9CI) (CA INDEX NAME)



RN 168842-50-0 HCA
CN Hafnium, bis(.eta.5-2,4-cyclopentadien-1-yl)bis(tricyclo[3.3.1.13,7]decan-1-olato)- (9CI) (CA INDEX NAME)



CC 29-10 (Organometallic and Organometalloidal Compounds)
Section cross-reference(s): 76

ST indium organometallic mass spectra; zirconium organometallic mass spectra; hafnium organometallic mass spectra; mass spectra indium zirconium hafnium organometallic; **MOCVD** indium zirconium hafnium organometallic; MIKES indium zirconium hafnium organometallic

IT Mass spectra
(**MOCVD** in relation to mass spectra of indium, zirconium and hafnium organometallics)

IT 12116-83-5D, Zirconocene, dialcoholates **53433-57-1D**, Hafnocene, dialcoholates 168842-45-3 **168842-48-6** **168842-49-7** **168842-50-0** 173066-05-2
173066-06-3 173066-07-4 173066-08-5 173066-09-6 173066-10-9
173066-11-0 173066-12-1 173066-13-2 173066-14-3 173066-15-4
(**MOCVD** in relation to mass spectra of)

L29 ANSWER 12 OF 16 HCA COPYRIGHT 2003 ACS on STN
123:304090 Langmuir probe measurements during plasma-activated **chemical vapor deposition** in the system argon/hydrogen/dicyclopentadienyldimethylhafnium. Spatenka, P.; Petig, M.; Wiesemann, K.; Suhr, H. (Fac. Biol. Sci., Univ. South Bohemia, Ceske Budejovice, 370 05, Czech Rep.). Plasma Chemistry and Plasma Processing, 15(3), 371-81 (English) 1995. CODEN: PCPPDW. ISSN: 0272-4324. Publisher: Plenum.

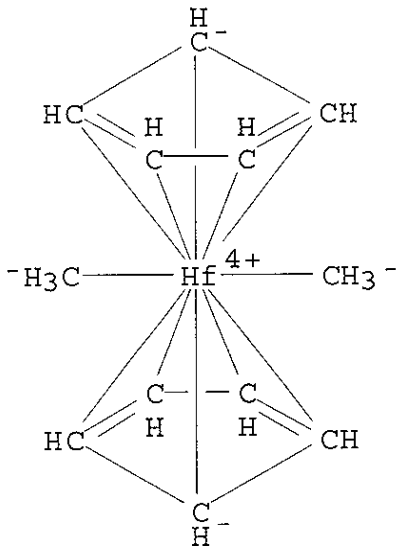
AB A Langmuir probe investigation of Ar/H2/Cp2HfMe2 plasmas is described. The probe measurements were performed for various discharge conditions. The mean electron energy and electron d. were measured for various power, gas flows of argon, and hydrogen and precursor concns. Addn. of the precursor into the discharge resulted in an appreciable decrease in the electron d. and an

increase in the mean electron energy. Whereas a transition from the .alpha.-mode to the .gamma.-mode has been obsd. with power rise in Ar/H2 plasmas without precursor, in the presence of the precursor the plasma .alpha.-mode remained unchanged in the power range investigated.

IT **37260-88-1**
(Langmuir probe measurements during plasma-activated **CVD** deposition in system argon/hydrogen/dicyclopentadienyldimethylhafnium)

RN 37260-88-1 HCA

CN Hafnium, bis(.eta.5-2,4-cyclopentadien-1-yl)dimethyl- (9CI) (CA INDEX NAME)



CC 76-11 (Electric Phenomena)

ST plasma **CVD** deposition argon hydrogen dicyclopentadienyldimethylhafnium; Langmuir probe plasma **CVD** deposition

IT 1333-74-0, Hydrogen, processes 7440-37-1, Argon, processes
37260-88-1
(Langmuir probe measurements during plasma-activated **CVD** deposition in system argon/hydrogen/dicyclopentadienyldimethylhafnium)

L29 ANSWER 13 OF 16 HCA COPYRIGHT 2003 ACS on STN

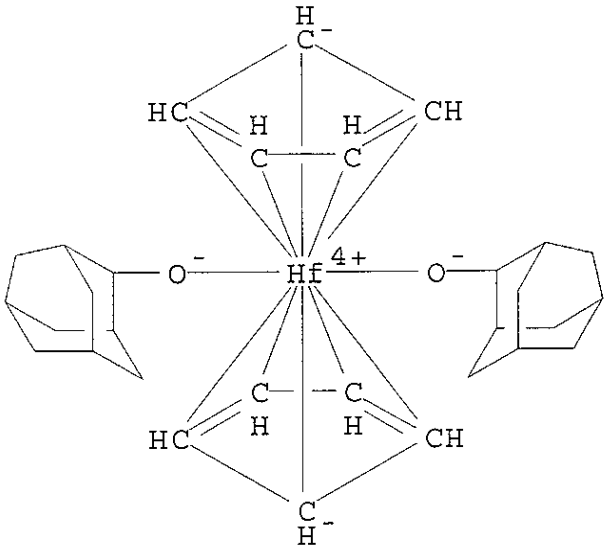
123:256913 Mass spectrometric study of some zirconocene and hafnocene diadamantanolates. Grafov, Andrei V.; Koval, Ludmila I.; Traldi, Pietro; Catinella, Silvia; Battiston, Giovanni A.; Zanella, Pierino (V.I. Vernadskii Institute of General and Inorganic Chemistry, Kiev, Ukraine). Rapid Communications in Mass Spectrometry, 9(9), 788-94 (English) 1995. CODEN: RCMSEF. ISSN: 0951-4198. Publisher: Wiley.

AB The electron ionization mass spectrometric behavior of hafnocene and zirconocene diadamantanolates is discussed. They are also compared

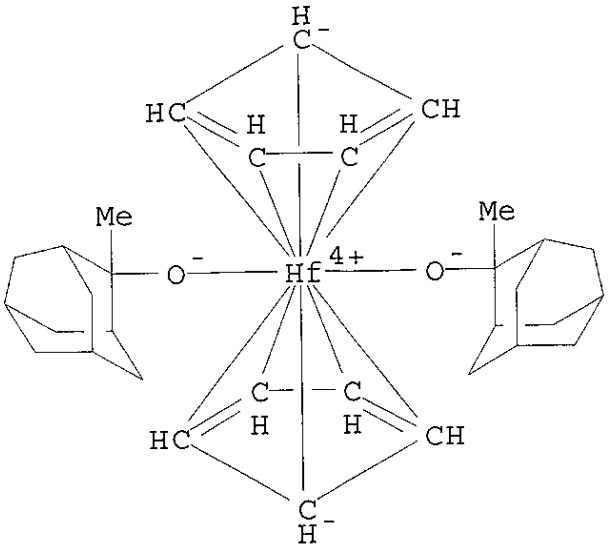
from mass-analyzed ion kinetic energy spectrometry. Fragmentation patterns of the complexes in question give relevant information on their gas-phase behavior as MO2/MC (M = Zr, Hf) precursors for metal-org. **CVD**.

IT **168842-48-6 168842-49-7 168842-50-0**
(mass spectrometric study of some zirconocene and hafnocene diadamantanolates)

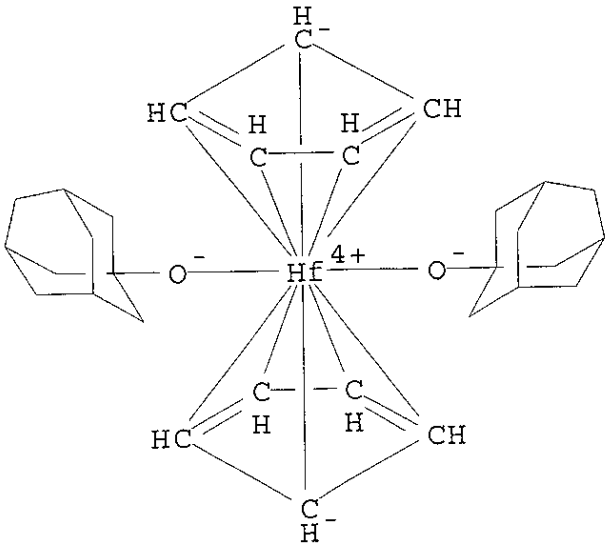
RN 168842-48-6 HCA
CN Hafnium, bis(.eta.5-2,4-cyclopentadien-1-yl)bis(tricyclo[3.3.1.13,7]decan-2-olato)- (9CI) (CA INDEX NAME)



RN 168842-49-7 HCA
CN Hafnium, bis(.eta.5-2,4-cyclopentadien-1-yl)bis(2-methyltricyclo[3.3.1.13,7]decan-2-olato)- (9CI) (CA INDEX NAME)



RN 168842-50-0 HCA
CN Hafnium, bis(.eta.5-2,4-cyclopentadien-1-yl)bis(tricyclo[3.3.1.13,7]decan-1-olato)- (9CI) (CA INDEX NAME)

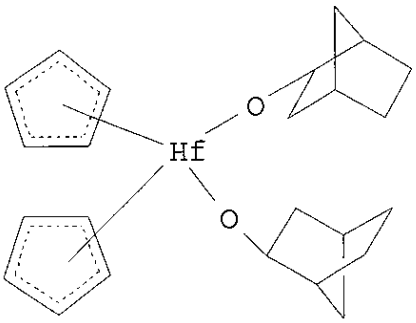


CC 29-10 (Organometallic and Organometalloidal Compounds)
IT 168842-45-3 168842-46-4 168842-47-5 **168842-48-6**
168842-49-7 168842-50-0
(mass spectrometric study of some zirconocene and hafnocene diadamantanolates)

L29 ANSWER 14 OF 16 HCA COPYRIGHT 2003 ACS on STN

123:169760 A new family of heavy transition metal coordination compounds and its application. I. Design, synthesis and characterization of volatile organohafnium precursors. Grafov, Andrei V.; Mazurenko, Eugene A.; Battiston, Giovanni A.; Zanella, Pierino; Tisato, Francesco; Braga, Franco; Traldi, Pietro (Institute General Inorganic Chemistry, National Academy of Sciences of Ukraine, Kiev, UA-252142, Ukraine). Applied Organometallic Chemistry, 9(3), 259-66 (English) 1995. CODEN: AOCHEX. ISSN: 0268-2605. Publisher: Wiley.

GI



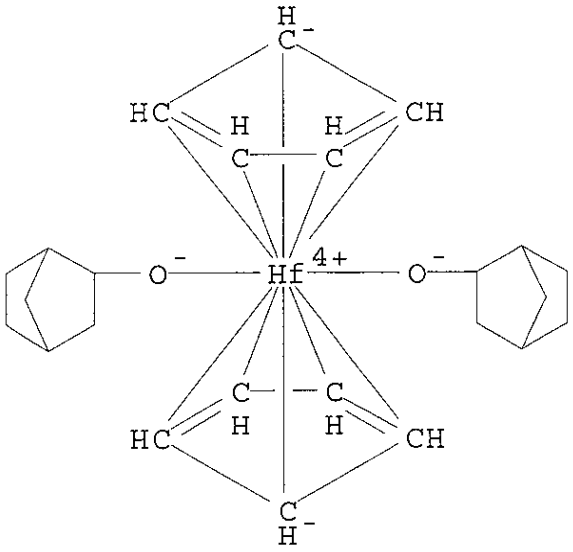
I

AB The 1st three representatives of a new family of volatile organohafnium compds. suitable as organometallic **CVD** precursors were synthesized. A combination of cyclopentadienyl and alkoxo ligands with a bicyclo[2.2.1]heptane framework was used. Thus, reaction of Cp2HfCl2 with LLi [LH = (-)-endo-borneol, (+)-endo-norborneol, (+)-exo-norborneol], formed from LH and BuLi in PhMe, gave 82-87% Cp2HfL2 (e.g., I). Volatility at relatively low temps. for Hf compds. was found and the precursors were characterized by elemental anal. and spectroscopic methods (IR, 1H and 13C NMR, mass spectrometry and mass-analyzed ion kinetic energy spectroscopy). The outlook for use in Hf functional materials synthesis was derived from the fragmentation data.

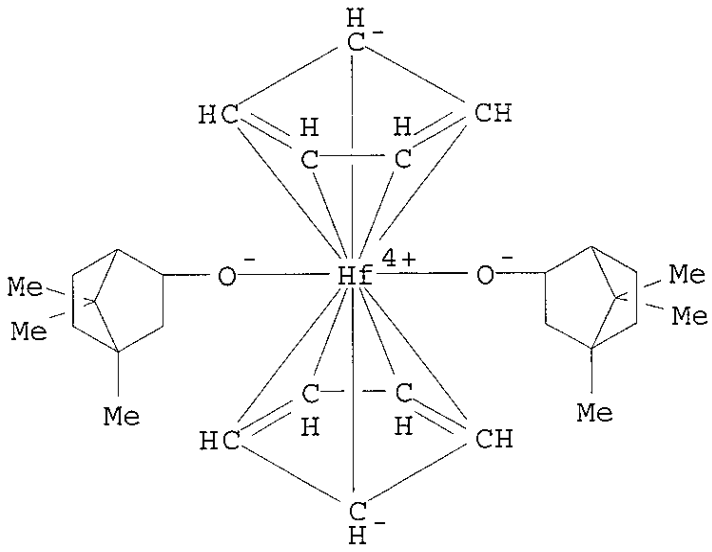
IT **148448-29-7P 148448-30-0P 148554-44-3P**
(prepn. of hafnocene borneol and norborneol derivs. as **CVD** precursors)

RN 148448-29-7 HCA

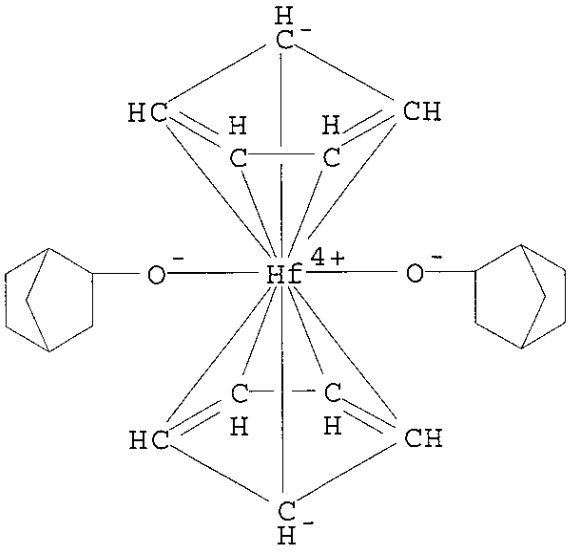
CN Hafnium, bis[(1S,2R,4R)-bicyclo[2.2.1]heptan-2-olato]bis(.eta.5-2,4-cyclopentadien-1-yl)- (9CI) (CA INDEX NAME)



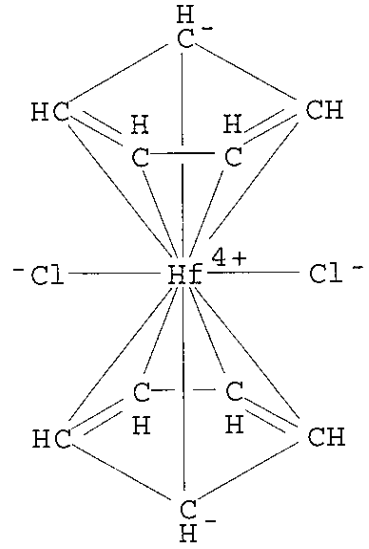
RN 148448-30-0 HCA
CN Hafnium, bis(.eta.5-2,4-cyclopentadien-1-yl)bis(1,7,7-trimethylbicyclo[2.2.1]heptan-2-olato)-, [1S-[1.alpha.,2.beta.(1R*,2S*,4S*),4.alpha.]]- (9CI) (CA INDEX NAME)



RN 148554-44-3 HCA
CN Hafnium, bis[(1R,2R,4S)-bicyclo[2.2.1]heptan-2-olato]bis(.eta.5-2,4-cyclopentadien-1-yl)- (9CI) (CA INDEX NAME)



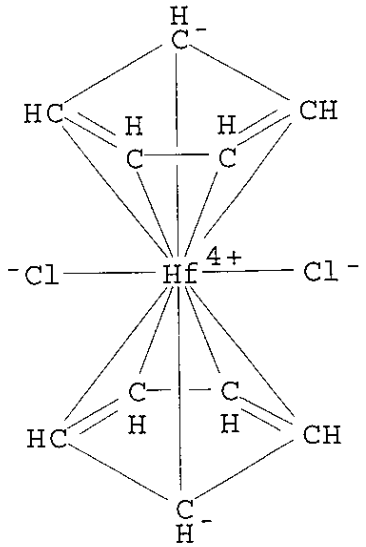
IT **12116-66-4**, Hafnocene dichloride
(prepn. of hafnocene borneol and norborneol derivs. as **CVD** precursors)
RN 12116-66-4 HCA
CN Hafnium, dichlorobis(.eta.5-2,4-cyclopentadien-1-yl)- (9CI) (CA INDEX NAME)



CC 29-10 (Organometallic and Organometalloidal Compounds)
ST hafnocene borneol norborneol prepn mass spectrum; bicycloheptane alkoxo ligand hafnium cyclopentadienyl; **CVD** precursor
hafnocene borneol norborneol

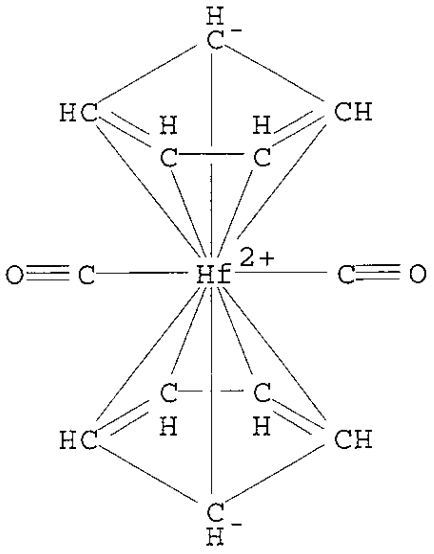
IT Vapor deposition processes
(prepn. of hafnocene borneol and norborneol derivs. as **CVD** precursors)
IT **148448-29-7P 148448-30-0P 148554-44-3P**
(prepn. of hafnocene borneol and norborneol derivs. as **CVD** precursors)
IT 464-45-9 **12116-66-4**, Hafnocene dichloride 29583-34-4
61277-90-5
(prepn. of hafnocene borneol and norborneol derivs. as **CVD** precursors)

L29 ANSWER 15 OF 16 HCA COPYRIGHT 2003 ACS on STN
122:176372 Materials for thin-film formation and manufacture of cyclopentadienyl carbonyl metal complexes. Mori, Hideyuki; Suzuki, Toshuki; Nakamura, Koichi (Japan Enajii Kk, Japan). Jpn. Kokai Tokkyo Koho JP 06179974 A2 19940628 Heisei, 4 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1992-352419 19921211.
AB The process involves alkylating biscyclopentadienyl metal dichloride with a C2-10-alkyl metal compd. and subsequently contacting with CO. The dichloride may include biscyclopentadienyl Ti, Zr, or Hf dichloride. The complexes are useful for vapor deposition of conductive, semiconductive, and insulative layers.
IT **12116-66-4**, Biscyclopentadienyl hafnium dichloride
(alkylation of)
RN 12116-66-4 HCA
CN Hafnium, dichlorobis(.eta.5-2,4-cyclopentadien-1-yl)- (9CI) (CA INDEX NAME)



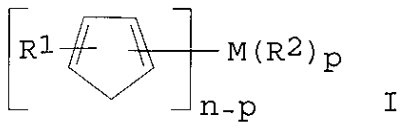
IT **59487-86-4P**
(prepn. and material for vapor deposition)
RN 59487-86-4 HCA
CN Hafnium, dicarbonylbis(.eta.5-2,4-cyclopentadien-1-yl)- (9CI) (CA

INDEX NAME)



IC ICM C23C016-18
ICS C07F017-00
ICA C07F007-28
CC 76-2 (Electric Phenomena)
Section cross-reference(s): 75, 78
IT Electric conductors
Electric insulators and Dielectrics
Semiconductor materials
(biscyclopentadienyldicarbonyl metal complexes for **CVD** of)
IT 1271-19-8, Biscyclopentadienyl titanium dichloride 1291-32-3, Biscyclopentadienyl zirconium dichloride **12116-66-4**, Biscyclopentadienyl hafnium dichloride
(alkylation of)
IT 12129-51-0P 59487-85-3P **59487-86-4P**
(prepn. and material for vapor deposition)

L29 ANSWER 16 OF 16 HCA COPYRIGHT 2003 ACS on STN
114:257442 **Chemical vapor deposition** of transition metals or their compounds, and organometallic compounds for the process. Erbil, Ahmet (Georgia Tech Research Corp., USA). U.S. US 4992305 A 19910212, 8 pp. (English). CODEN: USXXAM. APPLICATION: US 1988-210079 19880622.
GI



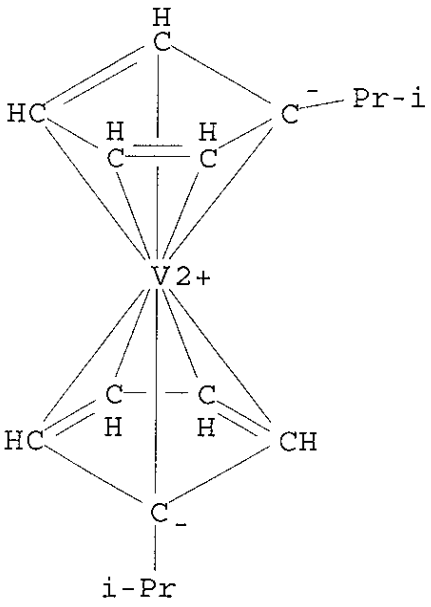
I

AB A film of a transition metal of Group VB, VIB, VIIB, or VIII, or its compd., is deposited on a heated substrate by bringing into contact with the substrate, heated above the decompn. temp. of the organometallic compd., a heat-decomposable organometallic compd. of the formula I, where M = metal of Group VB, VIB, VIIB, or VIII; R1 = C2-6 alkyl or alkenyl; R2 = H, C1-6 alkyl, or C2-6 alkenyl; n = 2-4 (the valence of M); and p = 0 to (n - 1).

IT **134097-05-5P**
(prepn. of, for **chem. vapor deposition** of vanadium and its compds.)

RN 134097-05-5 HCA

CN Vanadocene, 1,1'-bis(1-methylethyl)- (9CI) (CA INDEX NAME)



IC ICM C23C016-00
ICS C07F011-00; C07F017-00

NCL 427252000

CC 75-2 (Crystallography and Liquid Crystals)

ST **chem vapor deposition** transition metal; organometallic compd transition metal thermal decompn

IT Transition metals, uses and miscellaneous
(metallorg. **chem. vapor deposition** of)

IT 1314-62-1, Vanadium pentoxide, uses and miscellaneous 7439-98-7,

Molybdenum, uses and miscellaneous 7440-02-0, Nickel, uses and miscellaneous 7440-62-2, Vanadium, uses and miscellaneous 12136-78-6, Molybdenum disilicide
(metallorg. **chem. vapor deposition** of)

IT 4984-82-1P, Sodium cyclopentadienide
(prepn. and reaction of, in formation of organometallic compds. for **chem. vapor deposition** of transition metals and their compds.)

IT 64561-24-6P
(prepn. of, for **chem. vapor deposition** of molybdenum and its compds.)

IT 67126-05-0P
(prepn. of, for **chem. vapor deposition** of nickel)

IT **134097-05-5P**
(prepn. of, for **chem. vapor deposition** of vanadium and its compds.)